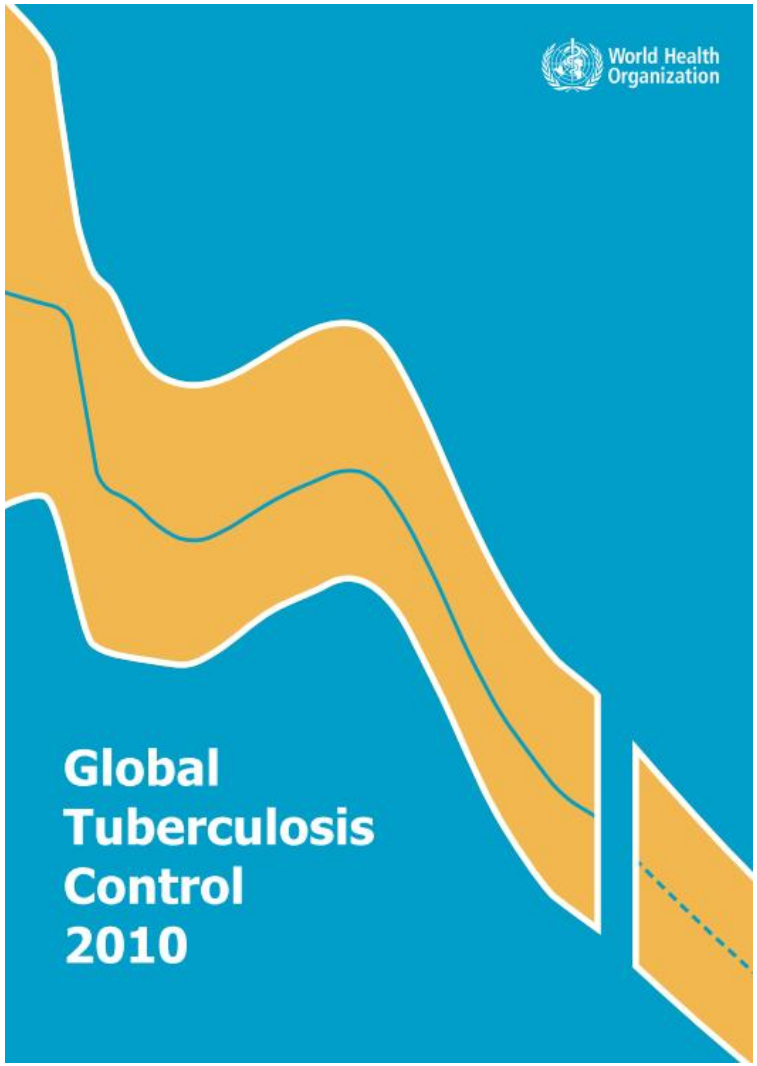
Global TB control:

Current status with particular attention to progress towards universal access

Data from Stop TB Department, World Health Organization

Soumya Swaminathan, MD
Coordinator, Research, TDR

Indo-US NIAID Drug Discovery Forum
New Delhi 20-21 April 2011



Published every year since 1997, to update global TB status: epidemiology, control and funding

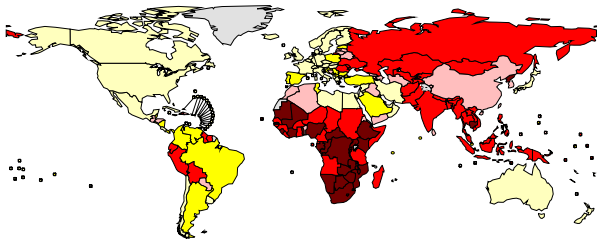
Overview

1. The global burden of TB (2009) and progress towards 2015 global targets for reductions in disease burden

2. Progress towards universal access

3. Research Roadmap and Funding Needs

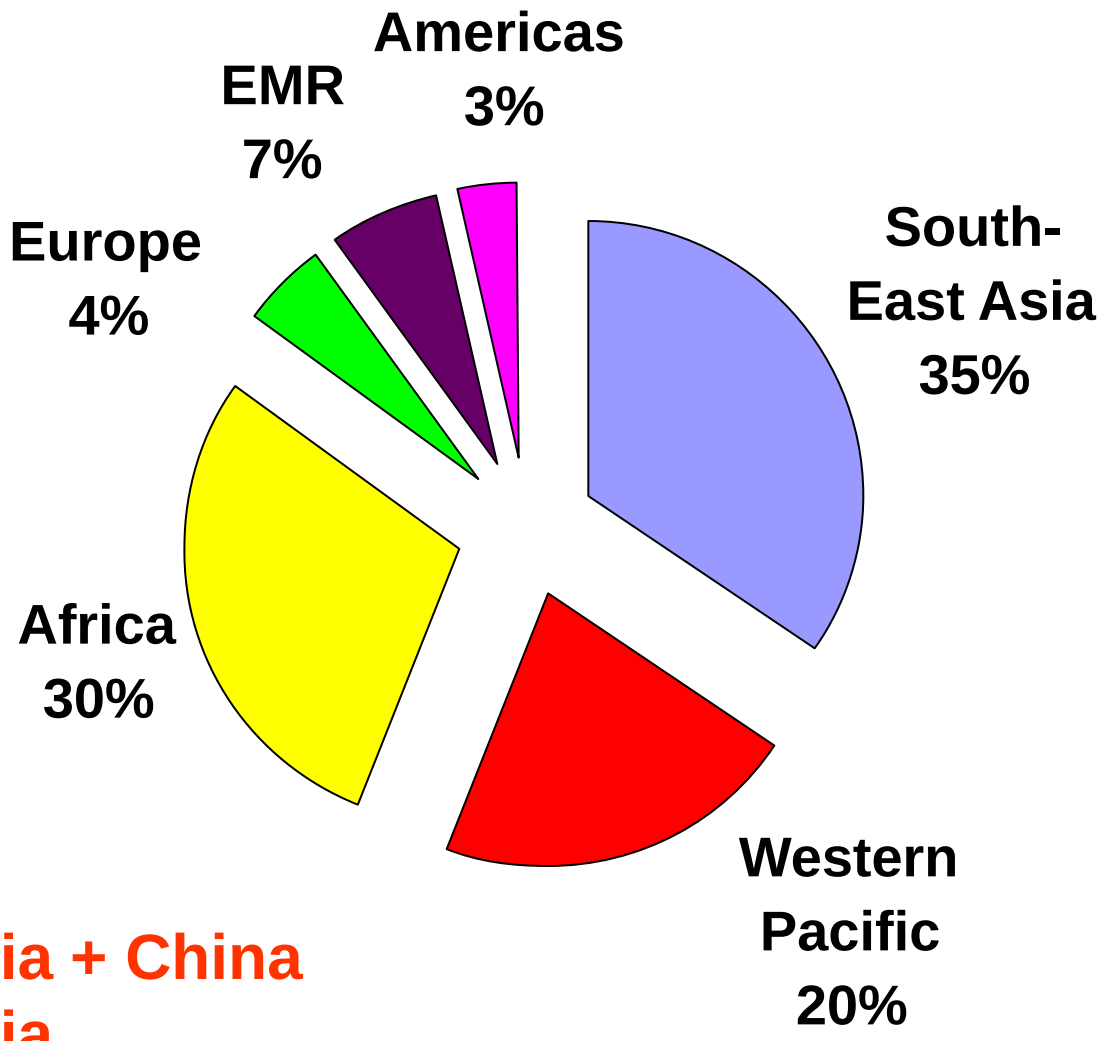
The global burden of TB in 2009



	Estimated number of cases	Estimated number of deaths
All forms of TB	9.4 million (range: 8.9–9.9 million)	1.3 million* (range: 1.2–1.5 million)
HIV-associated TB	1.1 million (12%) (range: 1.0–1.2 million)	380,000 (range: 320,000–450,000)
Multidrug-resistant TB (MDR-TB)	440,000 (range: 390,000–510,000)	150,000

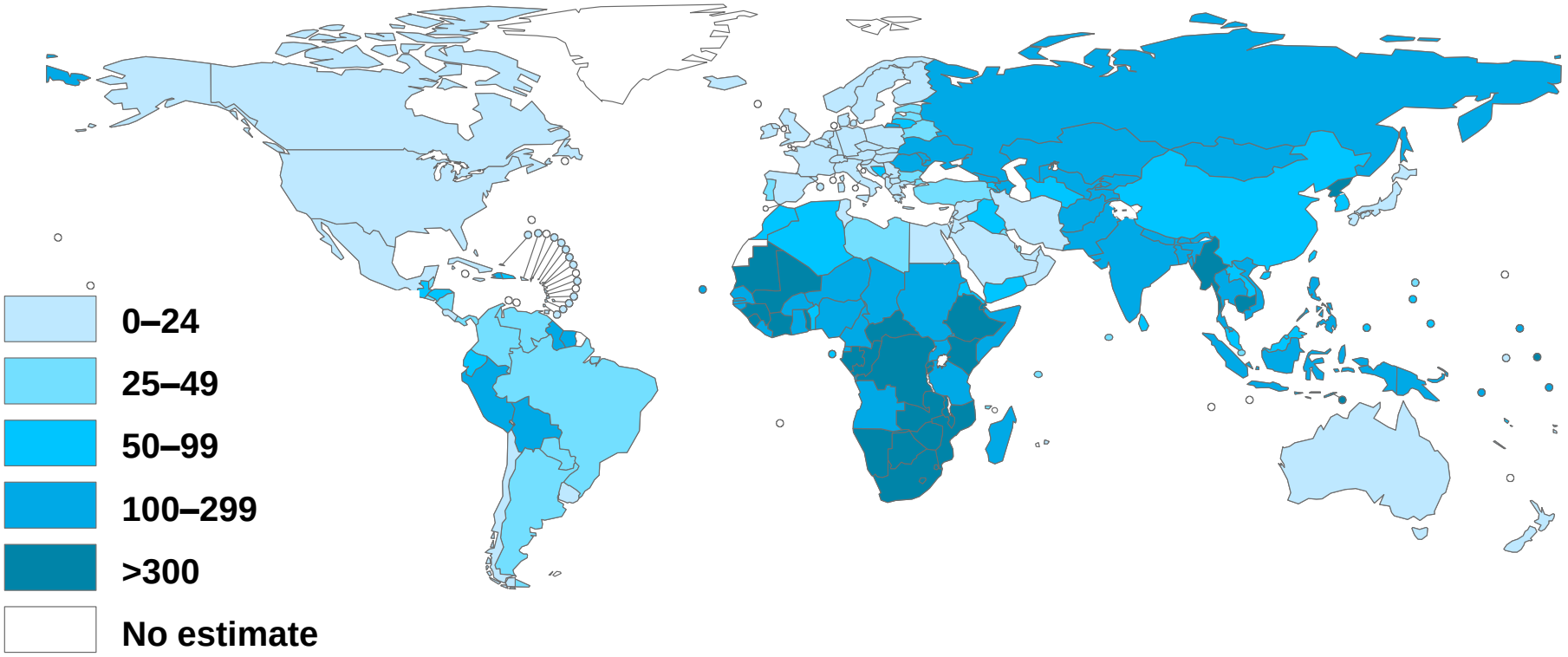
**excluding deaths among HIV+ people*

Most cases in Asia



35% in India + China
20% in India

Incidence rates, 2009

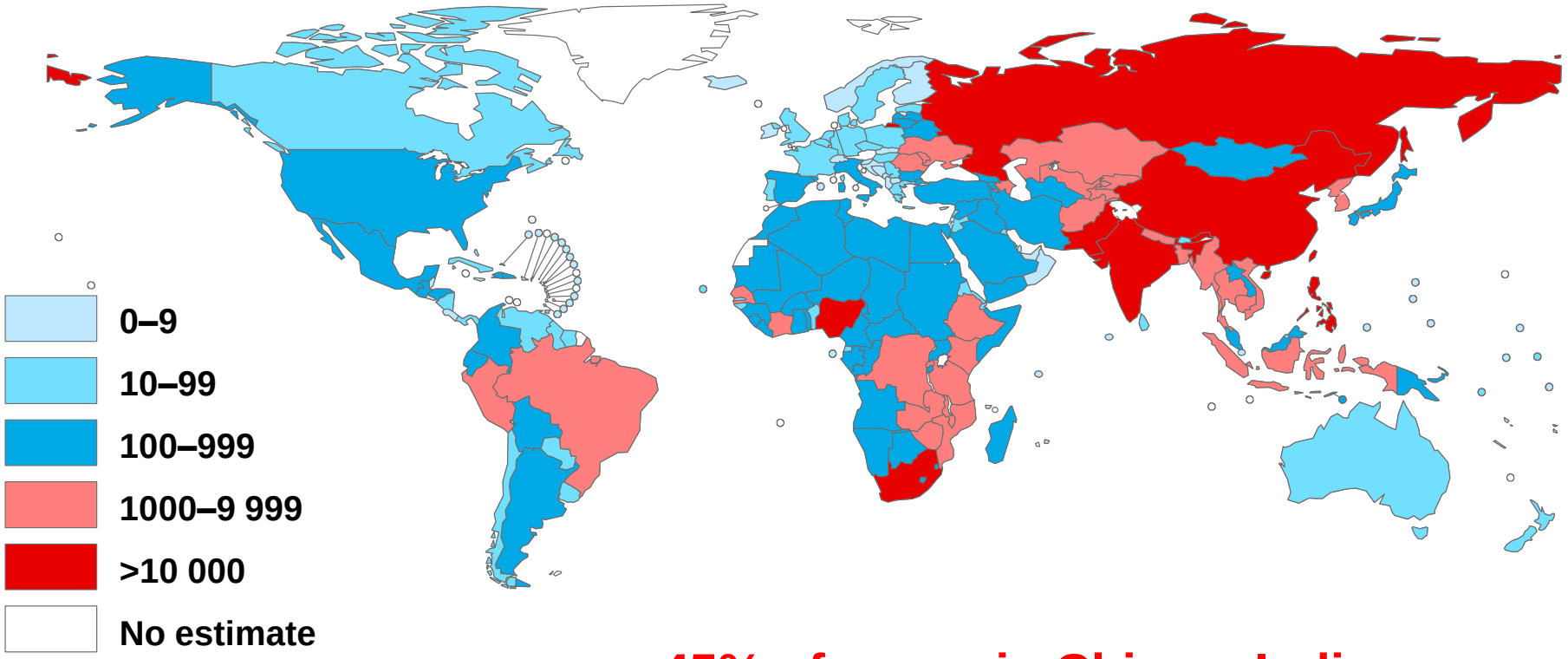


Per 100 000 population

Highest rates in Africa, linked to high rates of HIV infection

~80% of HIV+ TB cases in Africa

Absolute numbers of cases with MDR-TB



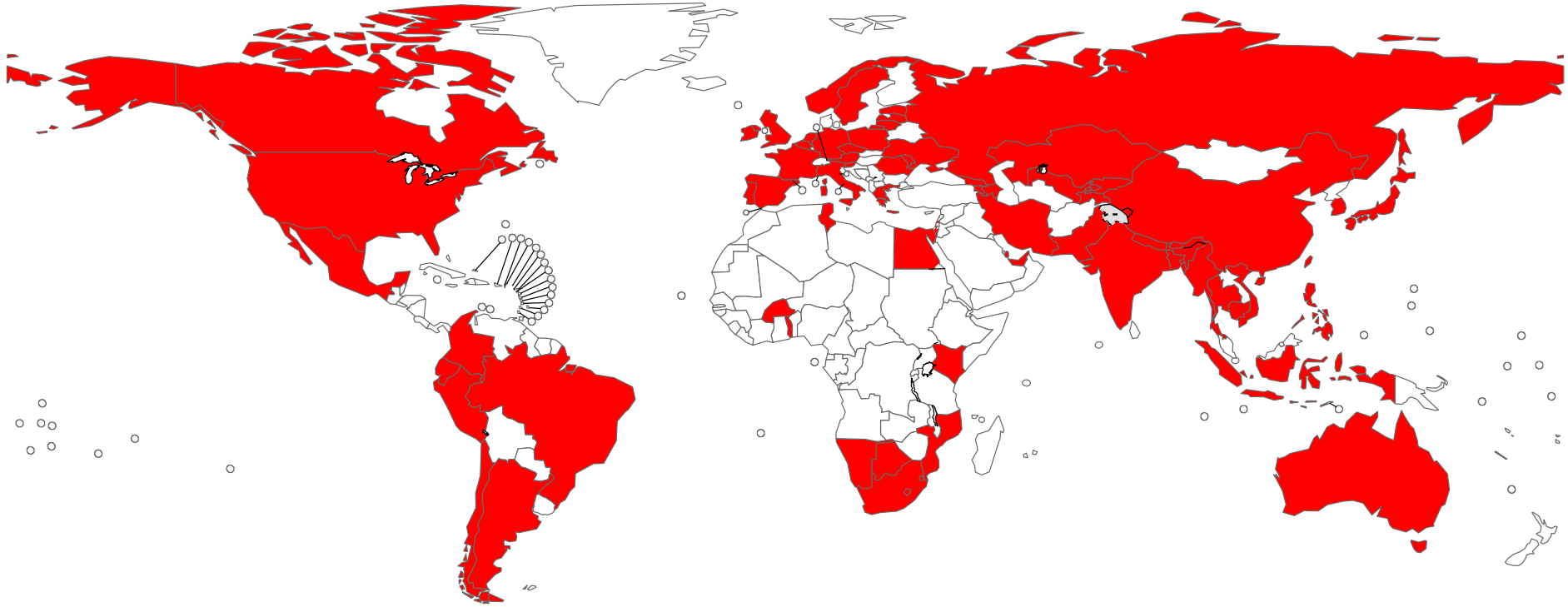
~ 45% of cases in China + India

~ 55% in China + India + Russian Federation

Countries that had reported at least one XDR-TB case by end March 2011

World Health Organization

THE STOP TB DEPARTMENT



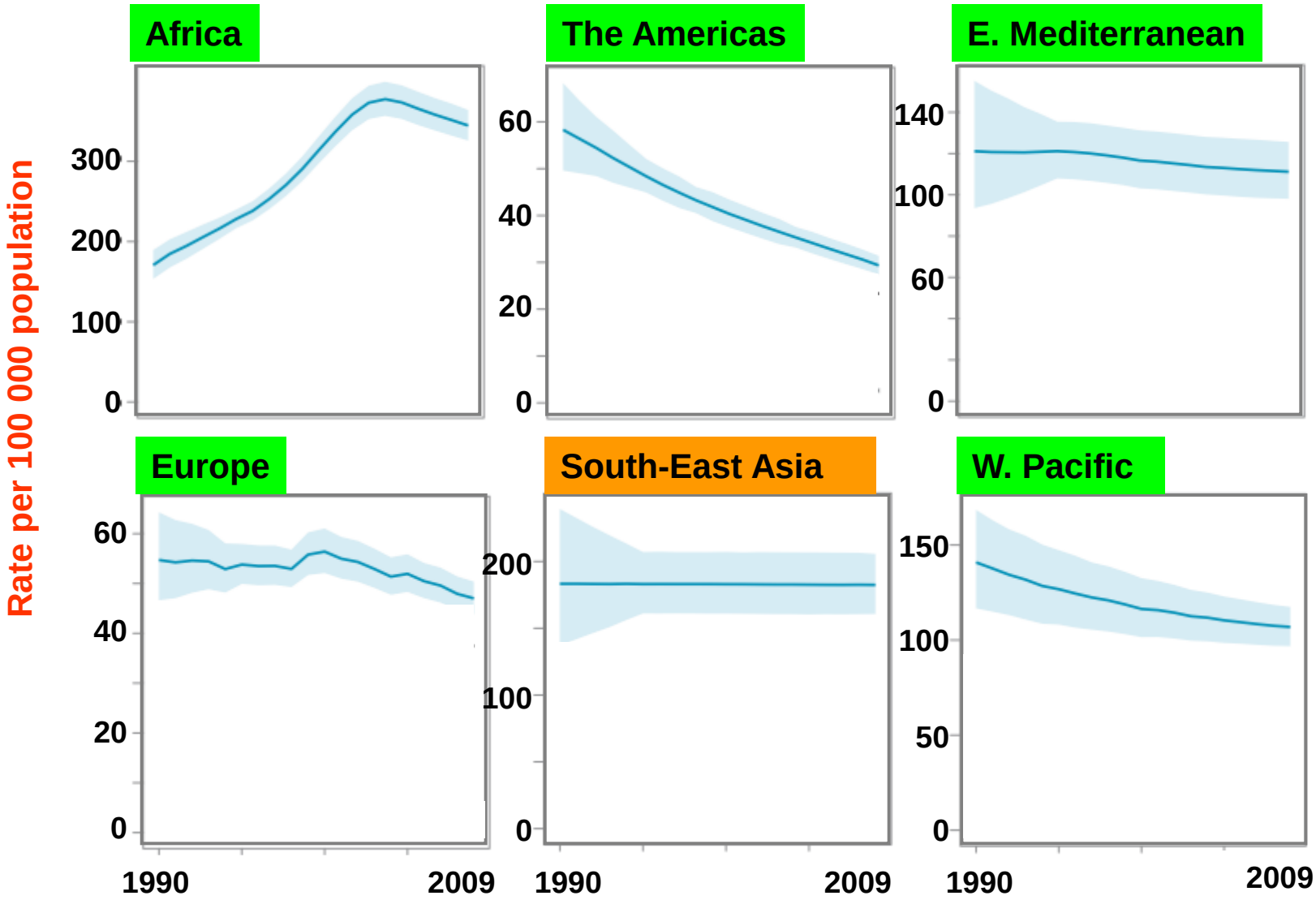
Argentina
Armenia
Australia
Austria
Azerbaijan
Bangladesh
Belgium
Botswana
Brazil
Burkina Faso
Bhutan
Cambodia
Canada
Chile
China
Colombia
Czech Republic
Ecuador
Egypt
Estonia
France
Georgia
Germany
Greece
India
Indonesia
Iran (Islamic Rep. of)
Ireland
Israel
Italy
Japan
Kazakhstan
Kenya
Kyrgyzstan
Latvia
Lesotho
Lithuania
Mexico
Mozambique
Myanmar
Namibia
Nepal
Netherlands
Norway
Pakistan
Peru
Philippines
Poland
Portugal
Qatar
Republic of Korea
Republic of Moldova
Romania
Russian Federation
Slovenia
South Africa
Spain
Swaziland
Sweden
Tajikistan
Thailand
Togo
Tunisia
Ukraine
United Arab Emirates
United Kingdom
United States of America
Uzbekistan
Viet Nam

Global targets for reductions in disease burden set for 2015

1. **Millennium Development Goals**
   - Halt and reverse incidence (MDG 6, Target 6.c)
2. **Stop TB Partnership**
   - Halve prevalence and mortality rates (per 100 000 population) compared with baseline of 1990

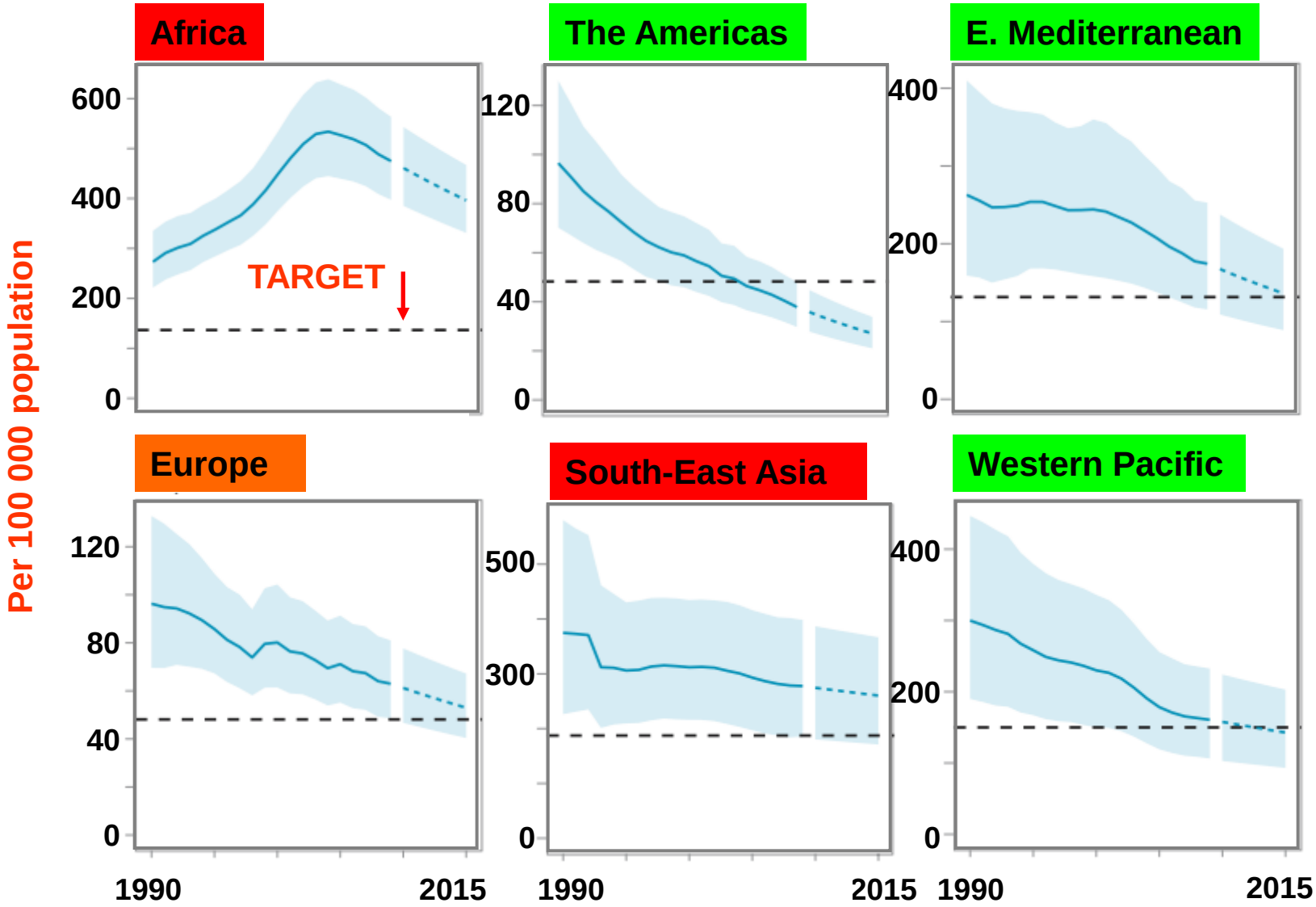
Incidence by region, 1990–2009

shaded areas = uncertainty bands



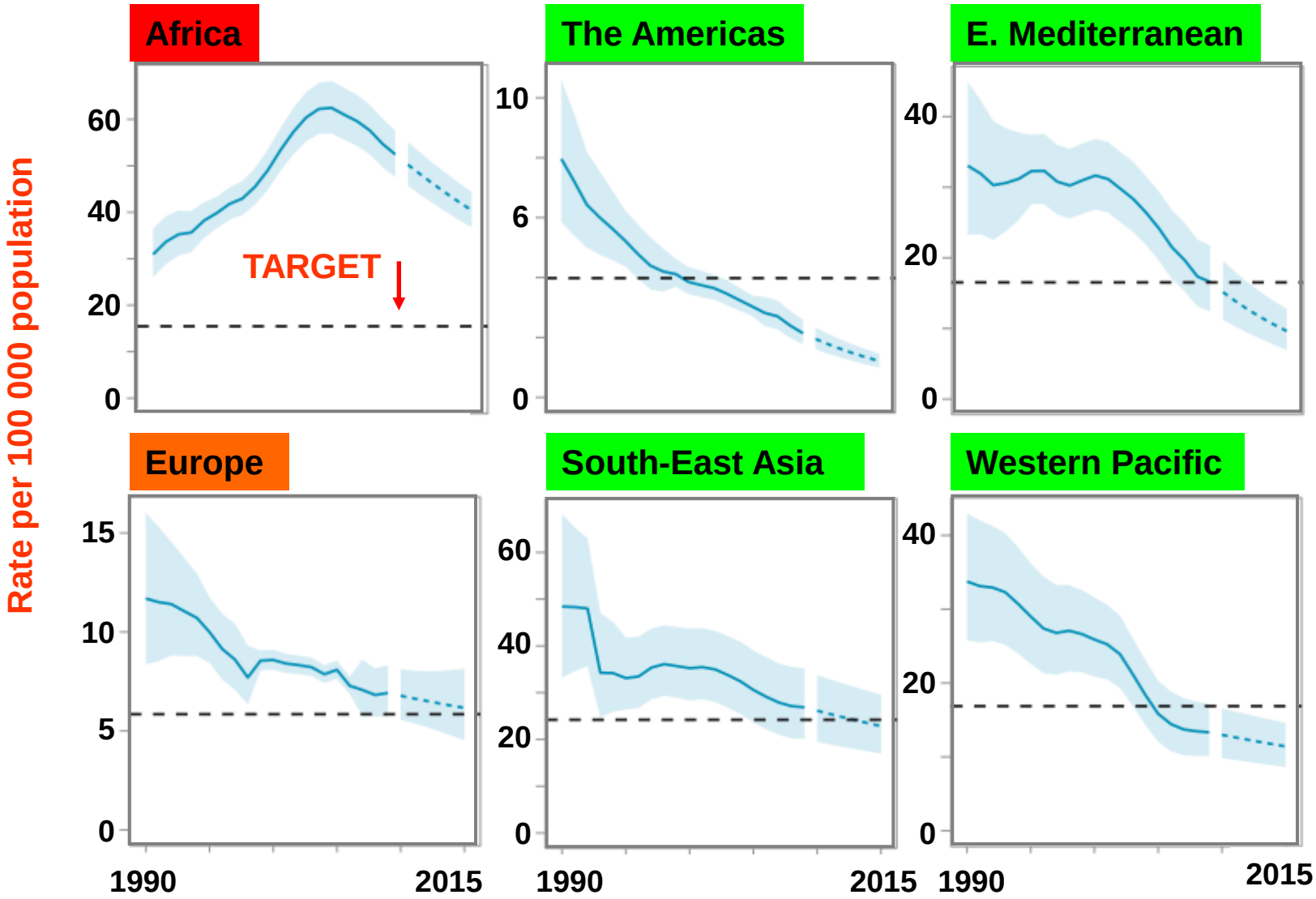
Prevalence by region,1990–2015

shaded areas = uncertainty bands

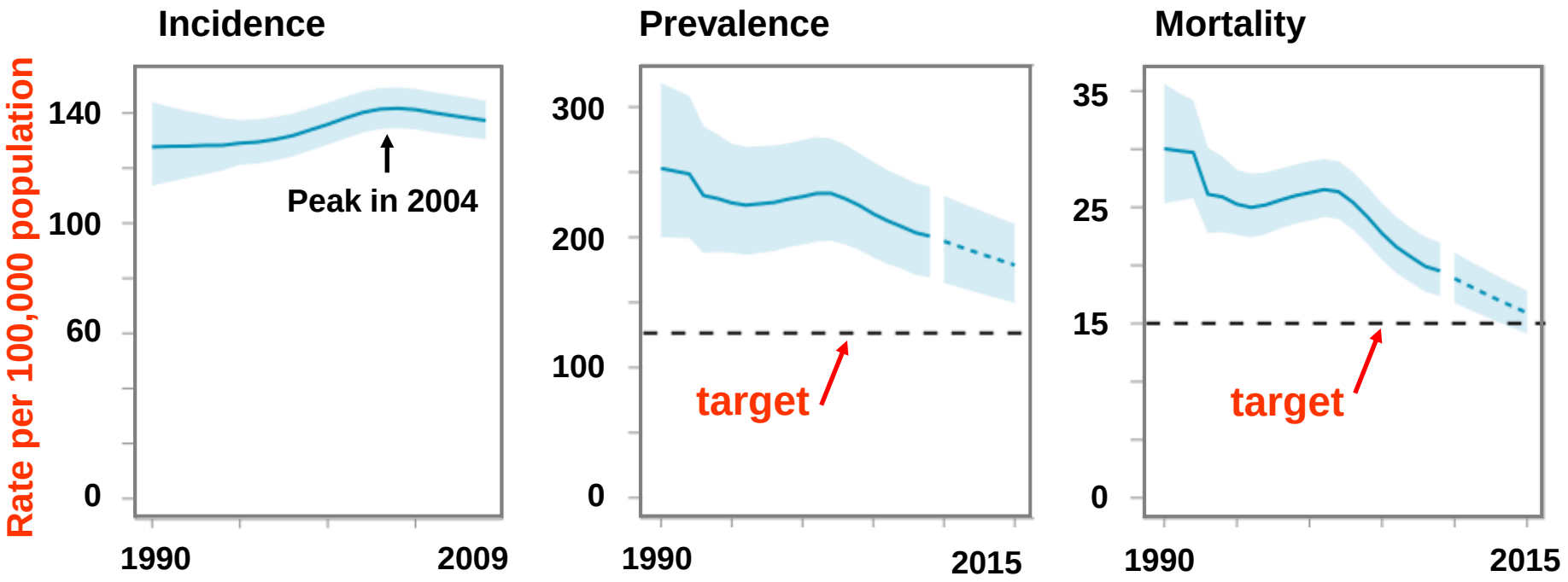


Mortality by region, 1990–2015

shaded areas = uncertainty bands

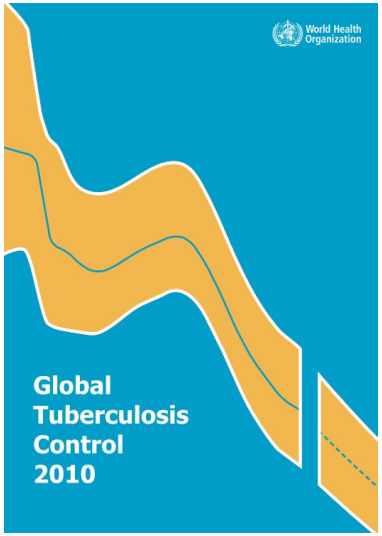


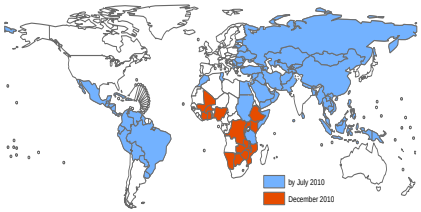
Incidence, prevalence and mortality: global estimates



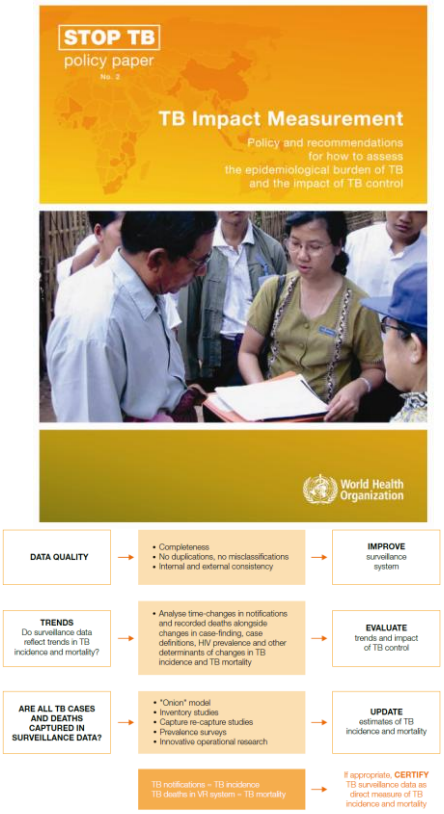
shaded area = uncertainty band

For further details





2010 WHO global TB control report, pp 32-40 and Annex 1

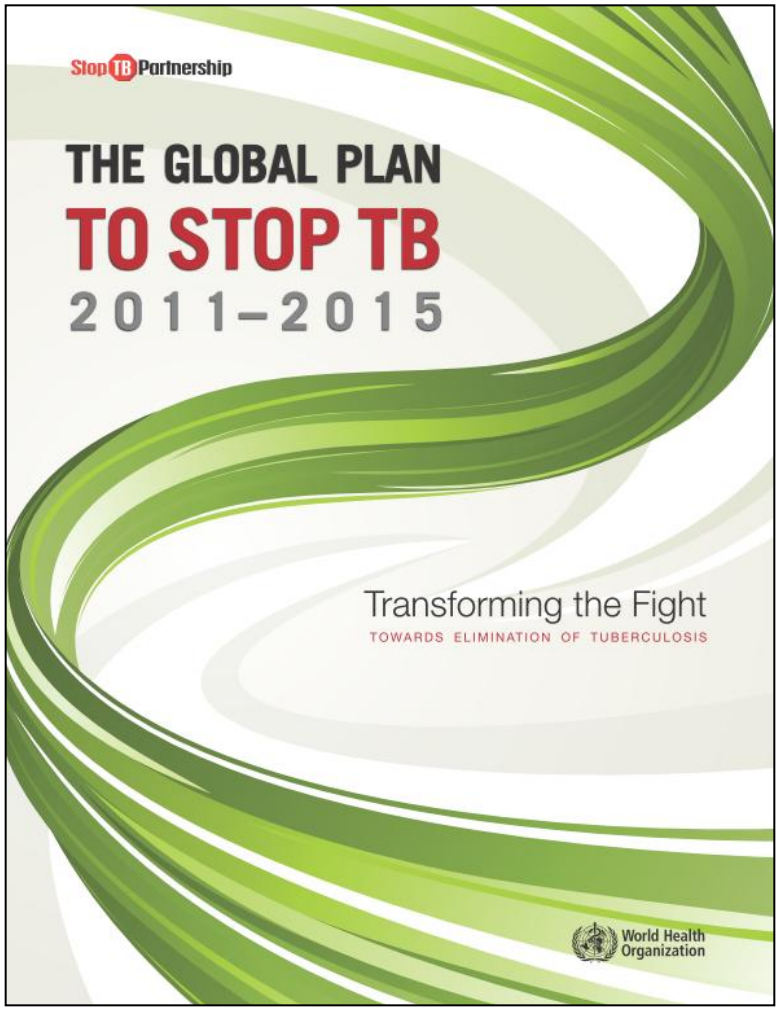


WHO Stop TB Policy Paper No. 2: TB Impact Measurement, 2009

Second Edition, Handbook on prevalence surveys, 2010, launch date 15 November

2. Progress towards universal access

Global Plan to Stop TB 2011–2015



Launched 13 October 2010

10 major targets for 2015, Global Plan

DOTS/lab strengthening

INDICATOR	TARGET
Number of countries with ≥1 smear microscopy lab per 100 000 population	149 (All countries in plan)
Patients notified + treated	6.9 million
Treatment success rate	90%

TB/HIV

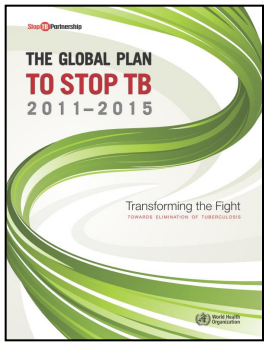
INDICATOR	TARGET
TB patients tested for HIV	100%
HIV+ TB patients on CPT	100%
HIV+ TB patients enrolled on ART	100%

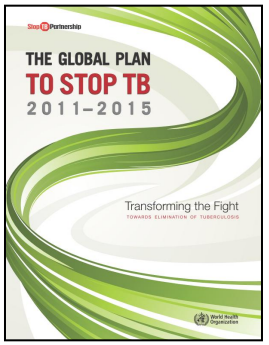
**CPT, cotrimoxazole preventive therapy*
ART, antiretroviral therapy

MDR-TB/lab strengthening

INDICATOR	TARGET
Number of 22 HBCs and 27 MDR-TB HBCs with ≥ 1 culture lab per 5M and ≥ 1 DST lab per 10M population	36/36
Previously treated cases tested for MDR	100%
New cases tested for MDR	20%, all at high-risk
MDR-TB patients treated following WHO guidelines	100%, or ~ 270 000

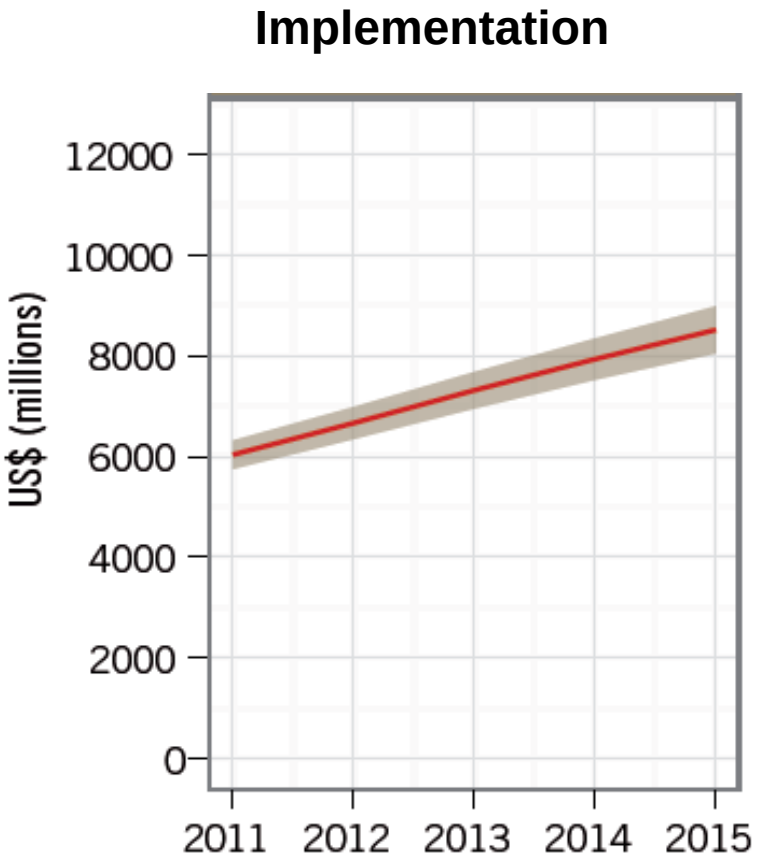
pp17





Funding required, Global Plan

Plan component	US$ billions, 2011–2015	% total
IMPLEMENTATION	36.9	79%
DOTS	22.6	48%
MDR-TB	7.1	15%
TB/HIV	2.8	6%
Lab strengthening	4.0	8%
Technical assistance	0.4	1%
R&D	9.8	21%
TOTAL	46.7	100%

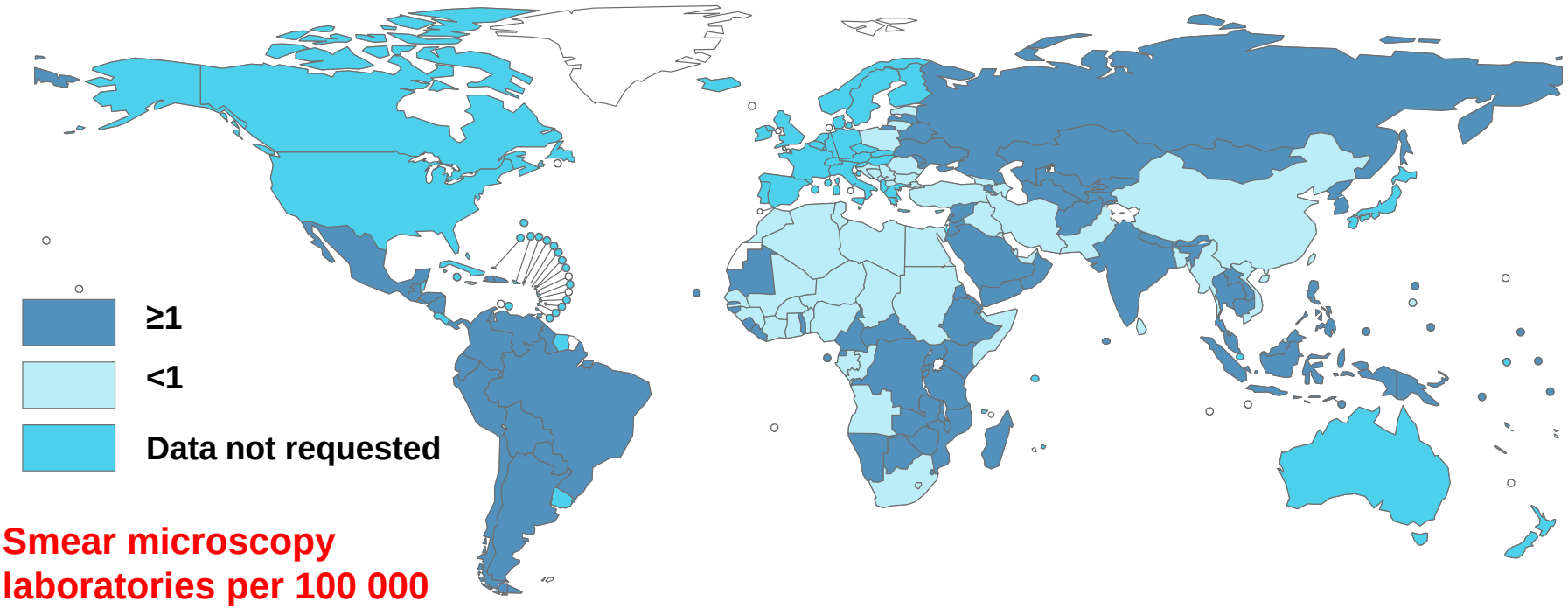


PLUS: Target that diagnosis should be free-of-charge or fully reimbursable by health insurance in all 22 high-burden countries (HBCs)

2. Progress towards universal access

a) DOTS and lab strengthening

Insufficient laboratory capacity to diagnose TB in 54 countries

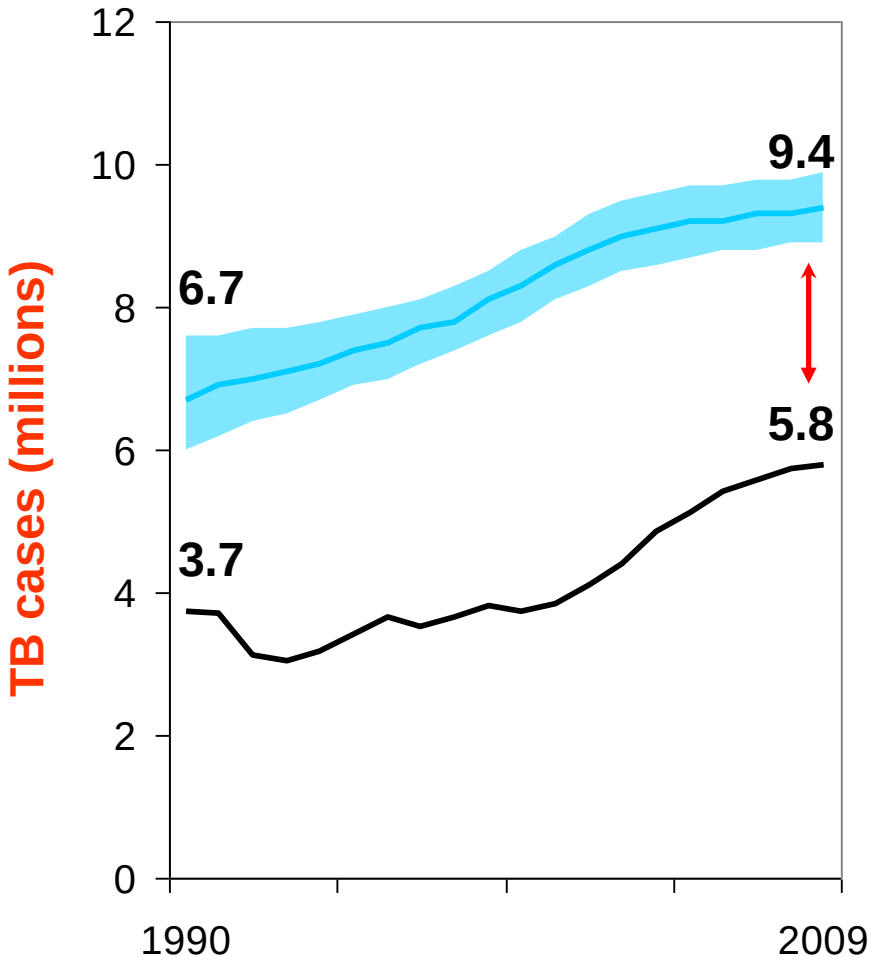


Smear microscopy laboratories per 100 000 population, 2009

27 high-burden countries (TB, MDR-TB, or HIV)
< 1 smear microscopy laboratory per 100,000 population

Global notifications (black)

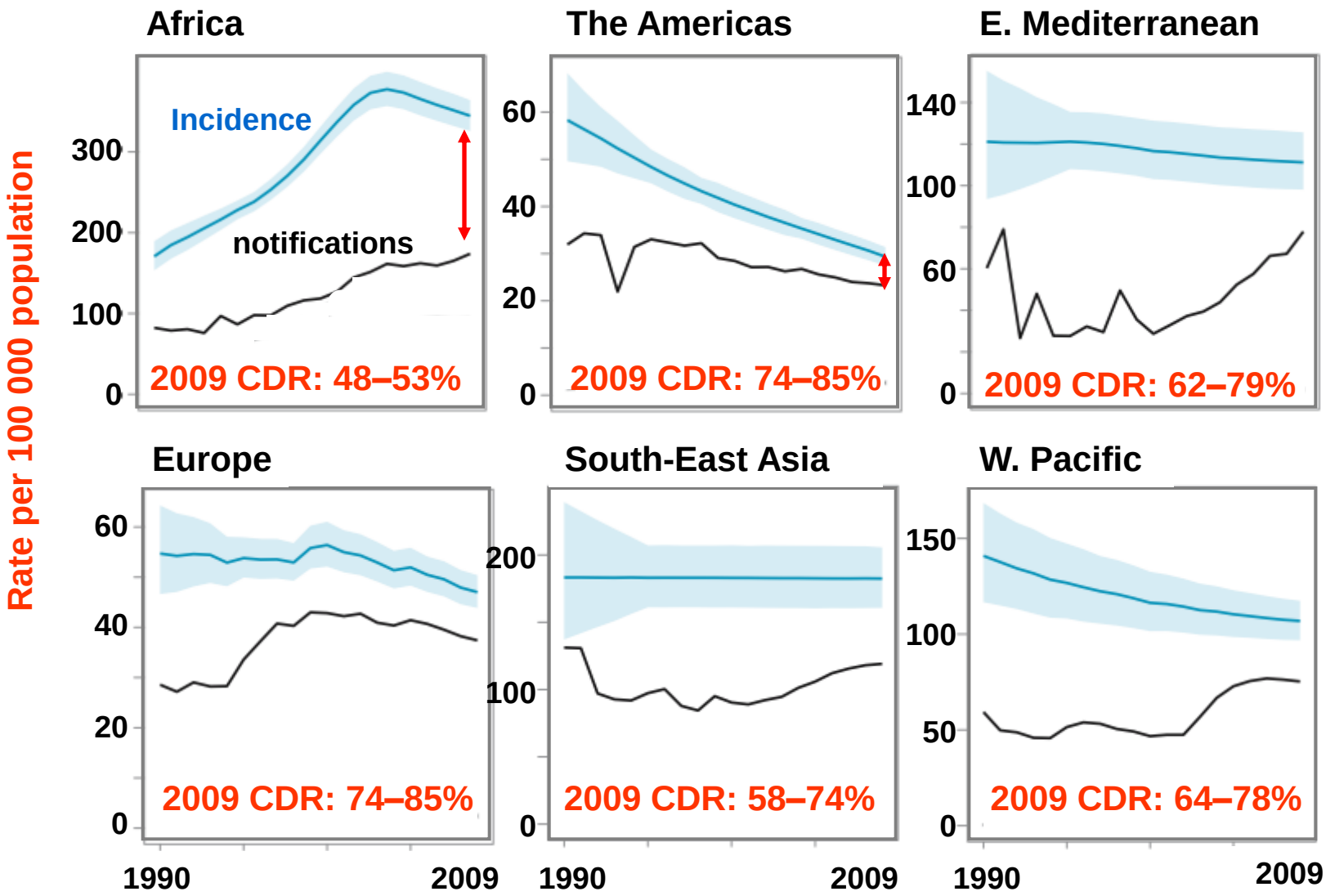
in context of estimated incidence (blue)



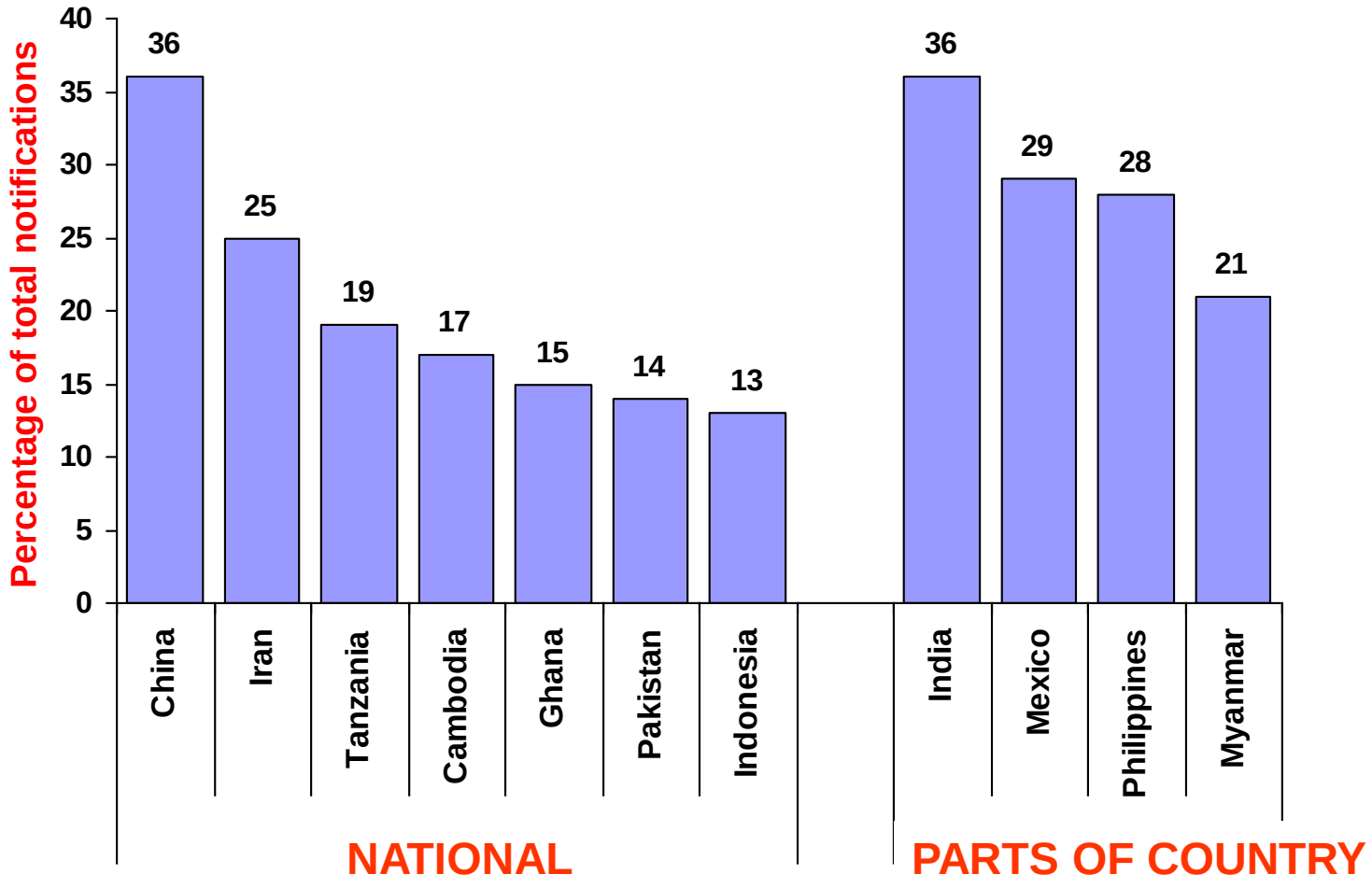
shaded area = uncertainty band

Case notifications by region, 1990–2009

Incidence in blue, shaded areas = uncertainty bands

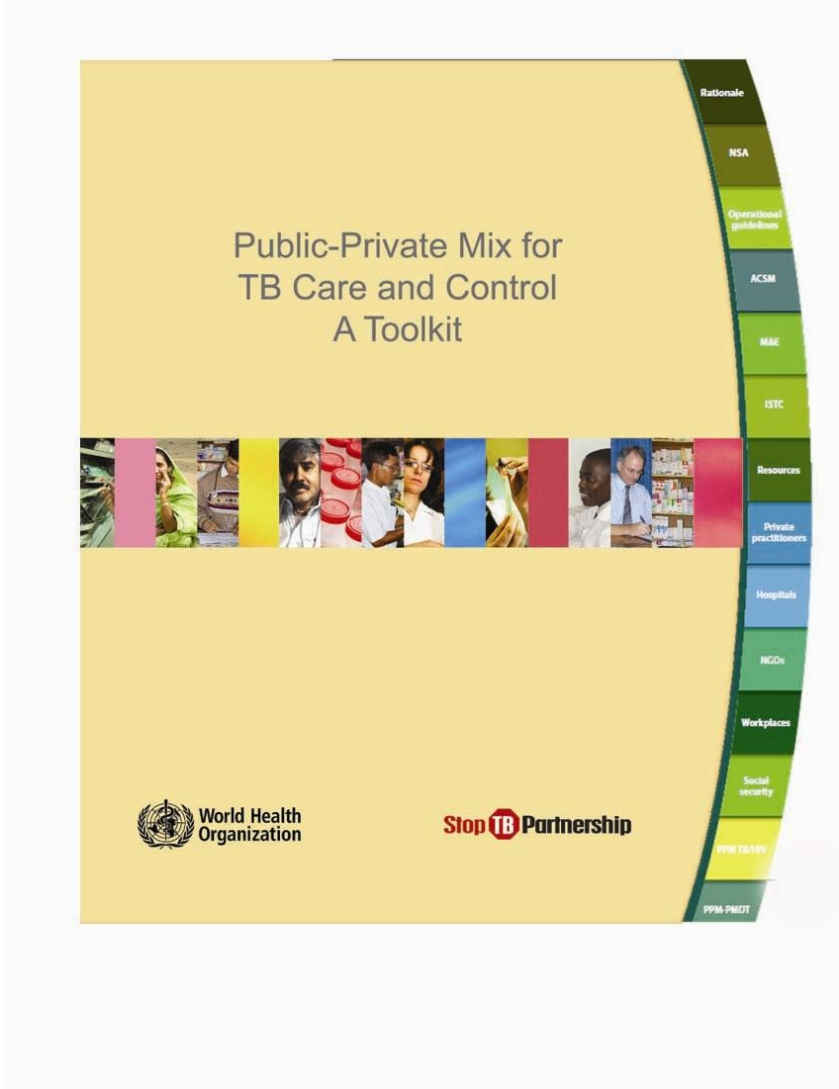


Increasing notifications via PPM (public-private mix)



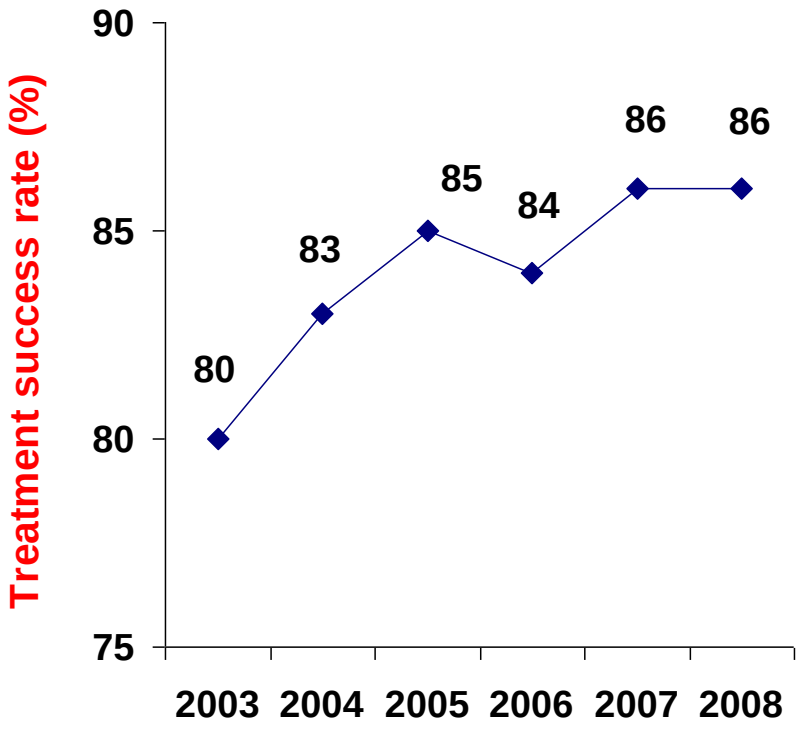
Source: 2010 WHO global TB control report, Table 7, page 16

PPM toolkit

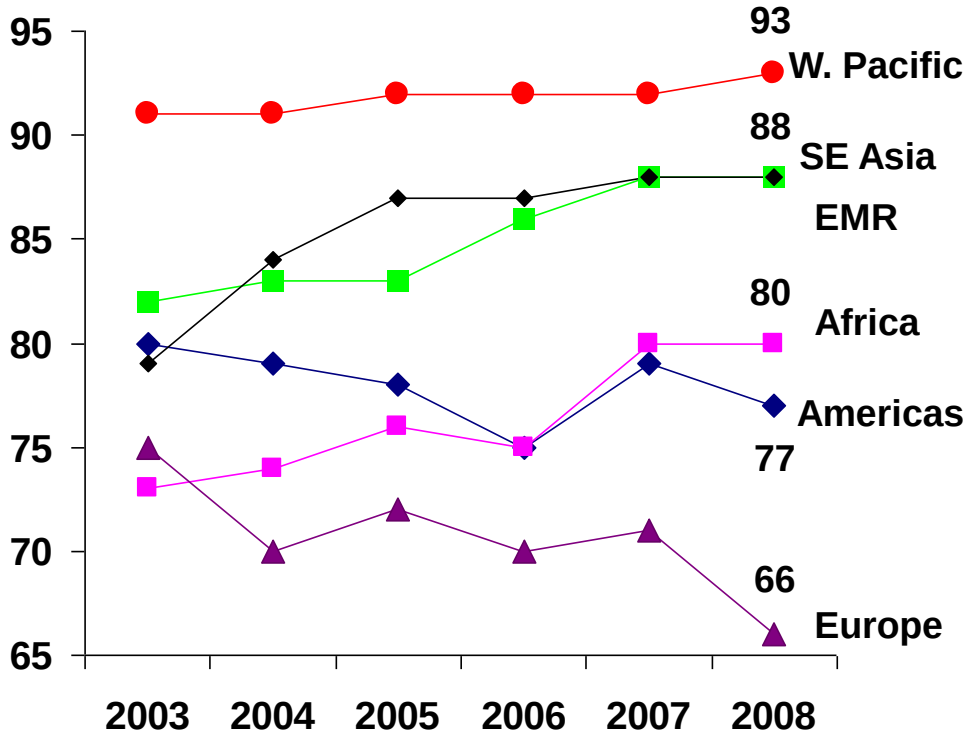

Public-Private Mix for
TB Care and Control
A Toolkit
World Health Organization
Stop TB Partnership
Rationale
NSA
Operational guidelines
ACSM
M&E
ISTC
Resources
Private practitioners
Hospitals
NGOs
Workplaces
Social security
PPM TB/HIV
PPM-PMDT

Treatment success 86% globally …but Europe lagging behind

Global



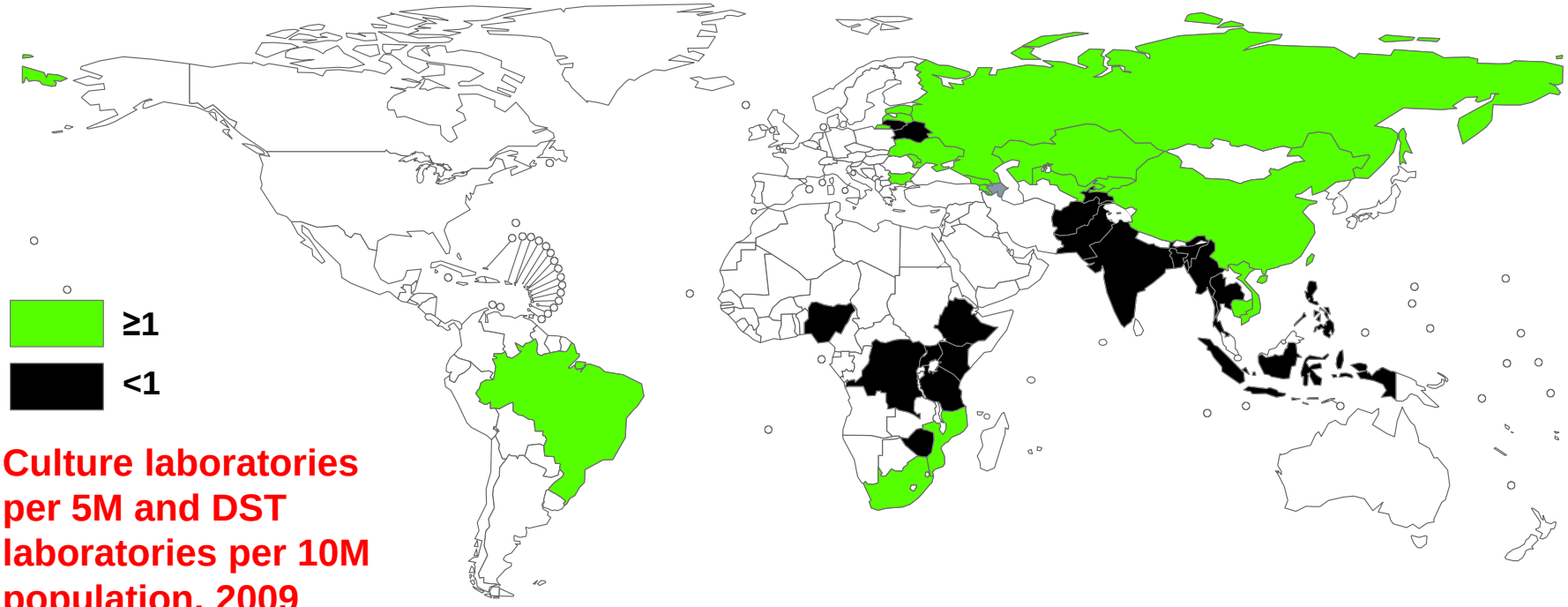
WHO Regions



2. Progress towards universal access

b) MDR-TB and lab strengthening

18/36 HBCs* have insufficient capacity to diagnose MDR-TB

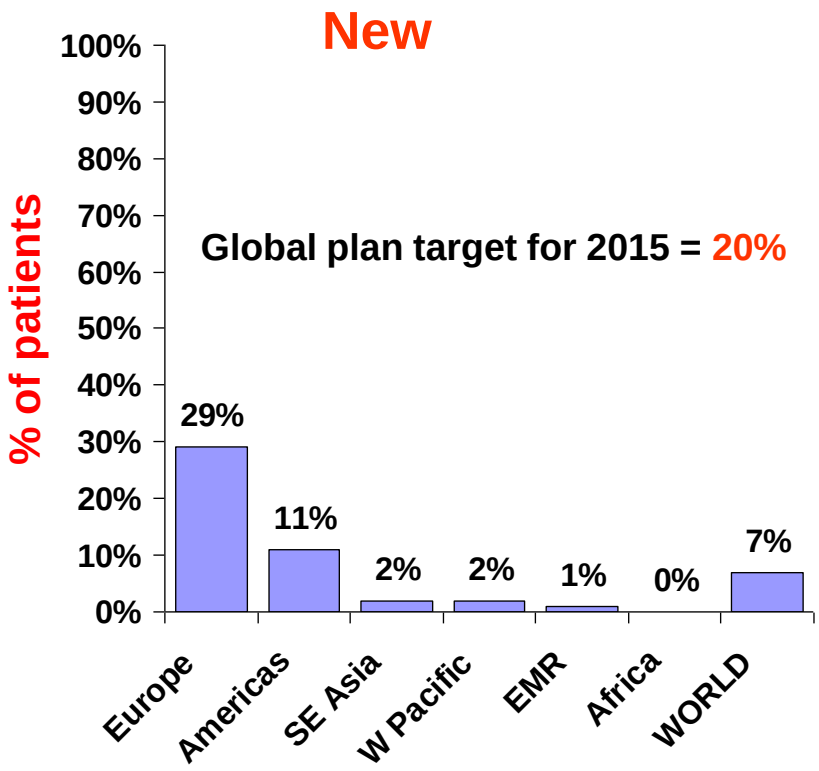


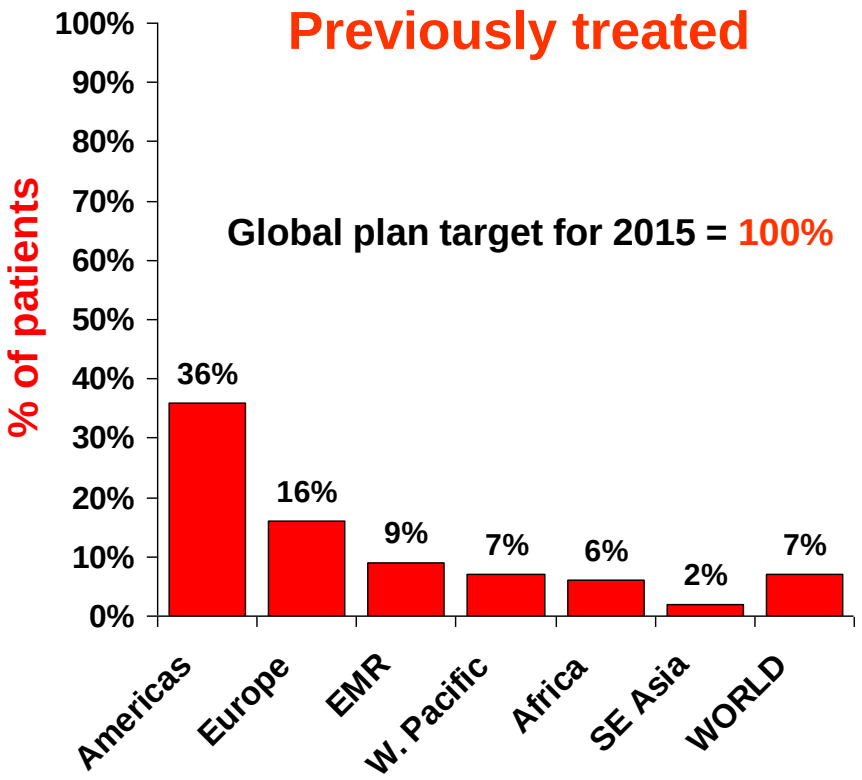
Culture laboratories per 5M and DST laboratories per 10M population, 2009

***HBC= high-burden country**

Countries = Afghanistan, Armenia, Azerbaijan, Bangladesh, Belarus, Brazil, Bulgaria, Cambodia, China, DR Congo, Estonia, Ethiopia, Georgia, India, Indonesia, Kazakhstan, Kenya, Kyrgyzstan, Latvia, Lithuania, Mozambique, Myanmar, Nigeria, Pakistan, Philippines, Republic of Moldova, Russian Federation, South Africa, Tajikistan, Tanzania, Thailand, Uganda, Ukraine, Uzbekistan, Viet Nam, Zimbabwe

Proportion of TB patients tested for MDR-TB remains low



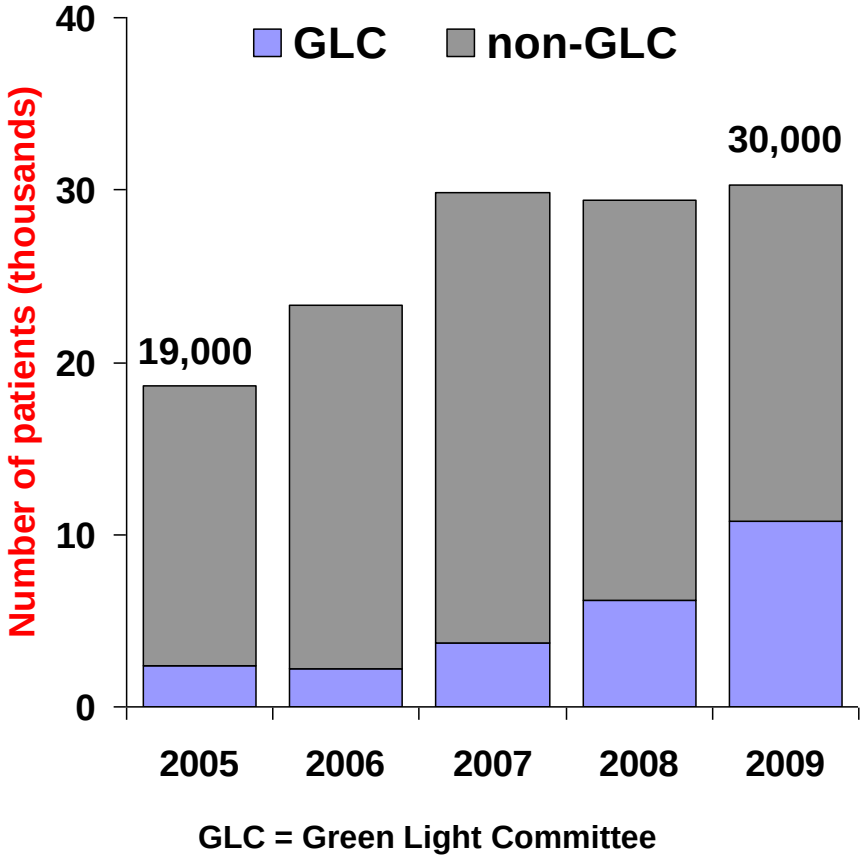


MDR-TB treatment expanding

BUT only reaching ~12% of TB patients who have MDR-TB

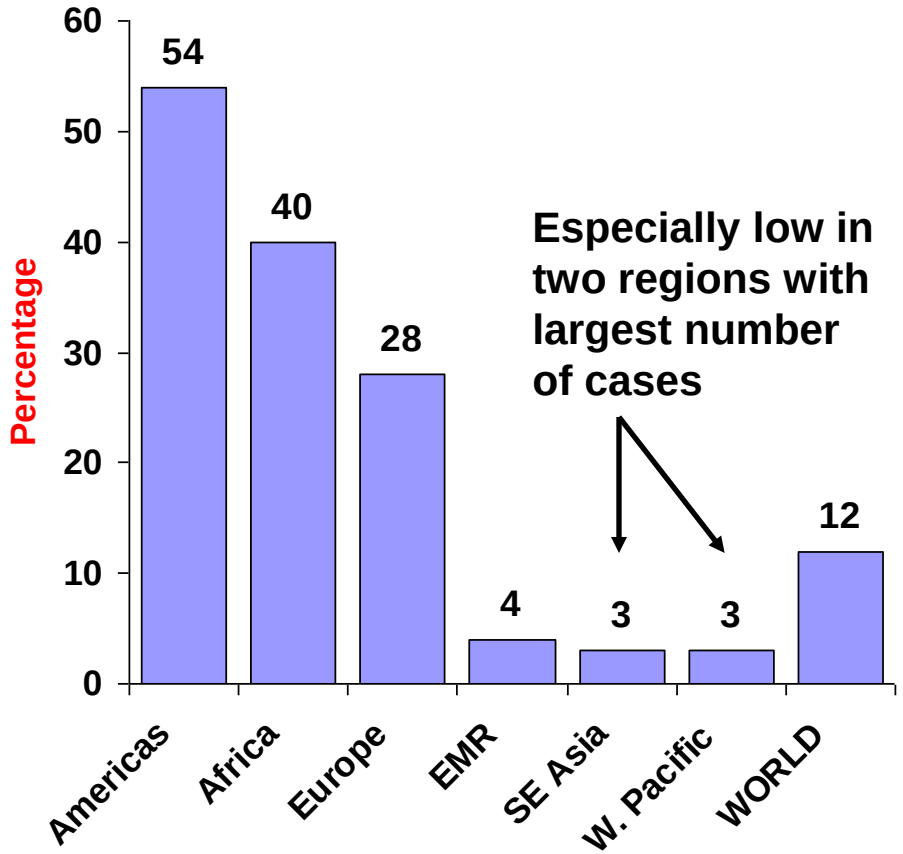
Numbers treated for MDR-TB

Global Plan target ~270,000 in 2015



GLC = Green Light Committee

Numbers treated as % total estimated cases of MDR-TB among all notified cases of TB

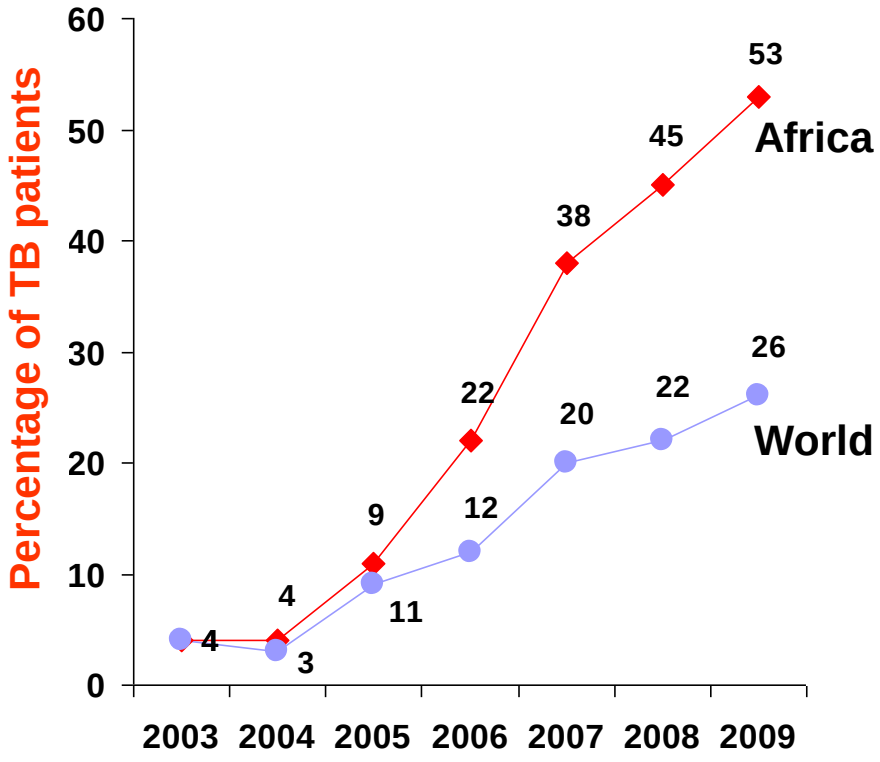


2. Progress towards universal access

c) TB/HIV

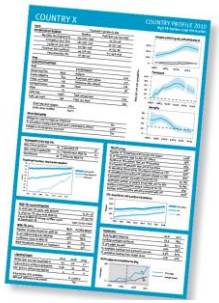
HIV testing for TB patients expanding

Although more needed to reach 100% targets in Global Plan



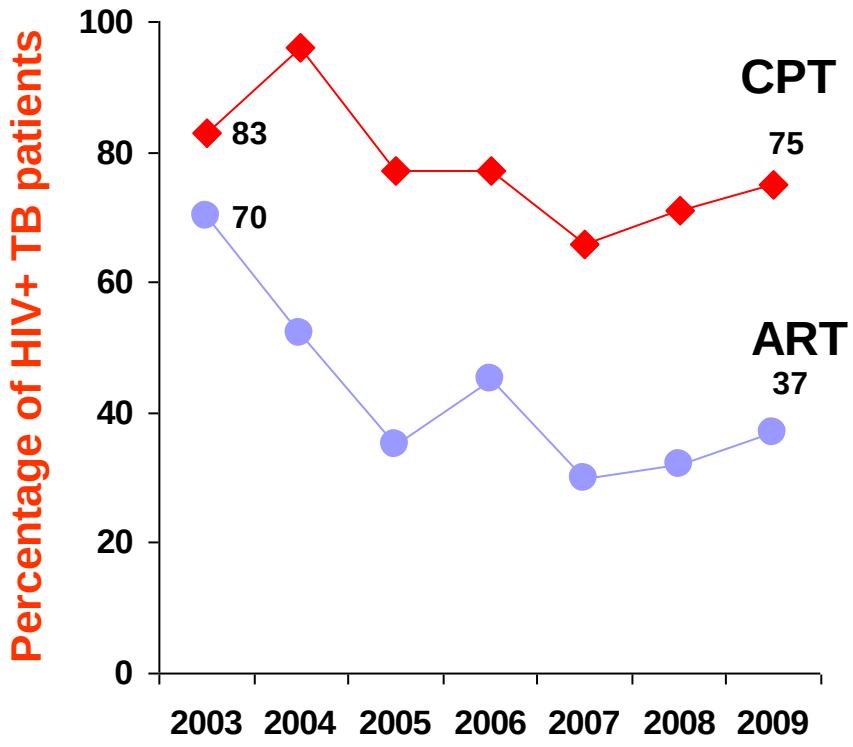
Several countries show very high testing rates achievable

Rwanda: 97%
Kenya: 88%
Tanzania: 88%
Malawi: 86%
Mozambique: 84%



CPT and ART for HIV-positive TB patients also expanding

Although more needed to reach 100% targets in Global Plan



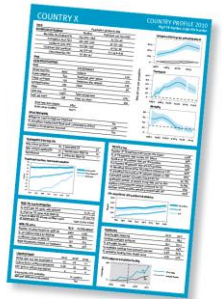
Several countries show higher rates of enrolment are possible

CPT 86%–97% in 2009

Kenya, Malawi, Mozambique, Rwanda, Tanzania, Uganda

ART close to 50% in 2009

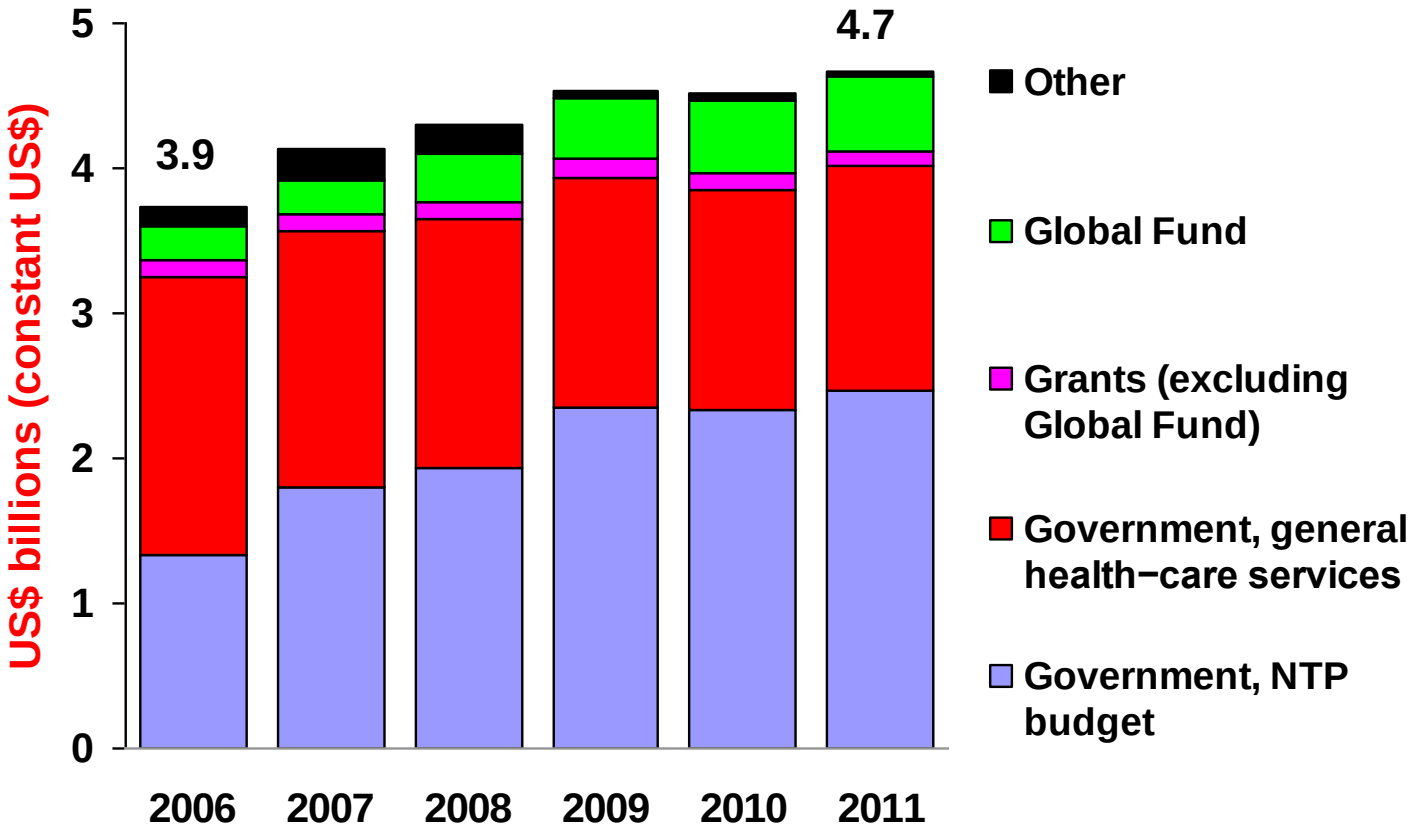
Rwanda, Malawi



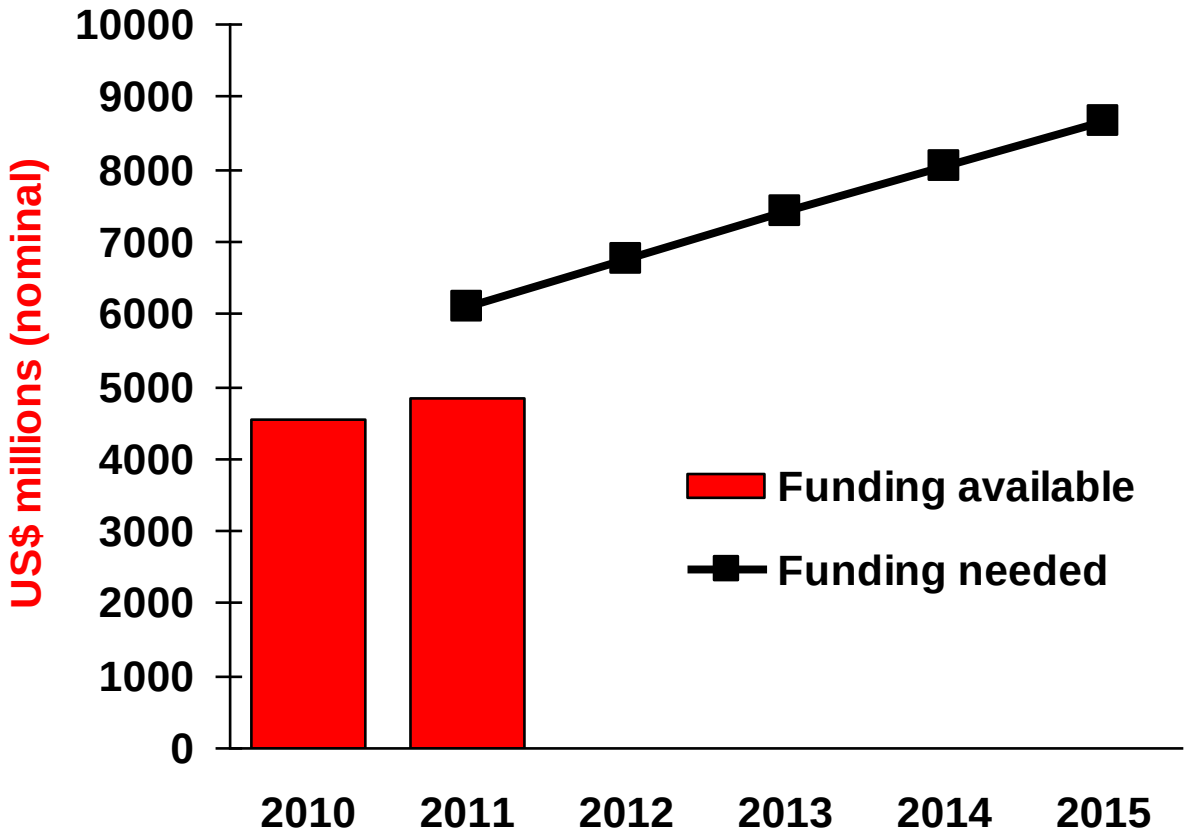
2. Progress towards universal access

d) financing

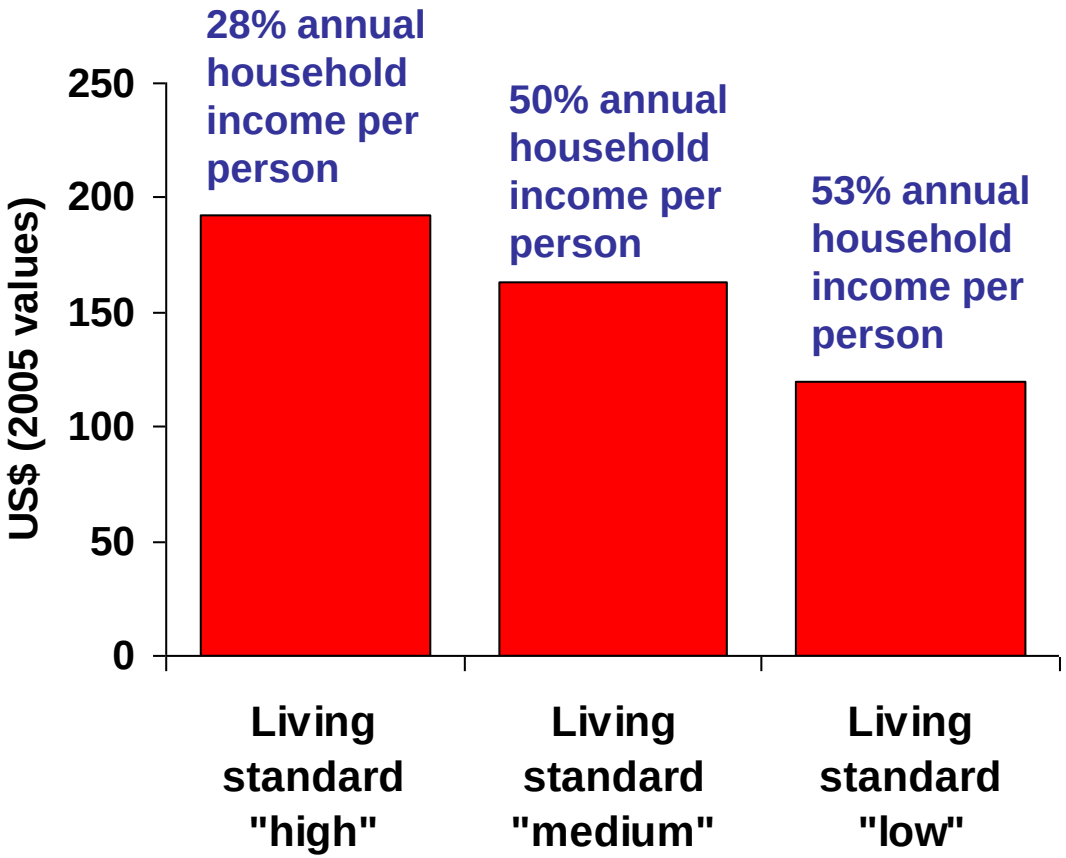
Funding for TB control increasing



Funding 2010–2011 vs. funding needs in the Global Plan, 2011–2015



High costs to patients to access TB diagnosis: an example from Bangalore, India

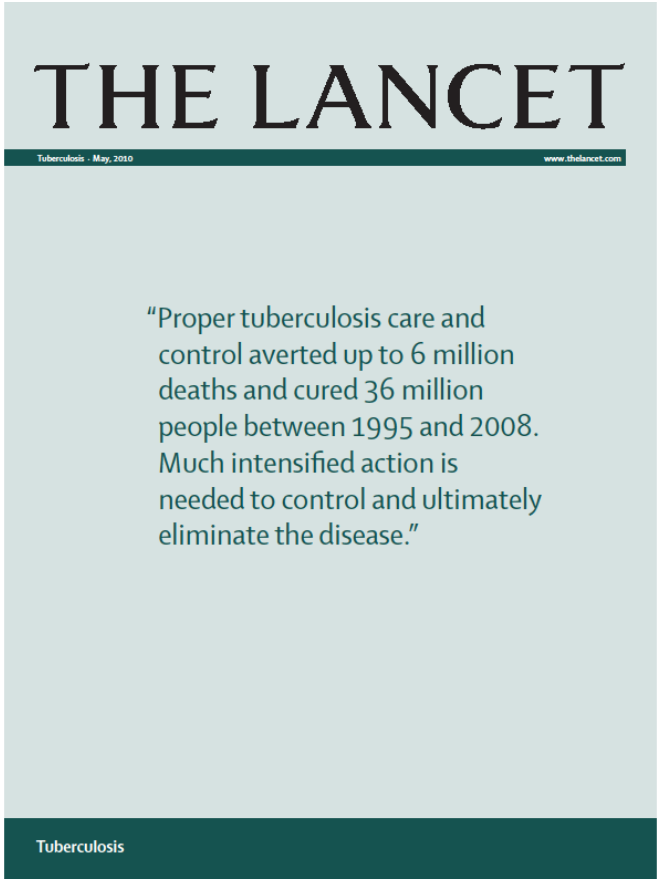


Living standard definitions based on those used in National Family Health Survey

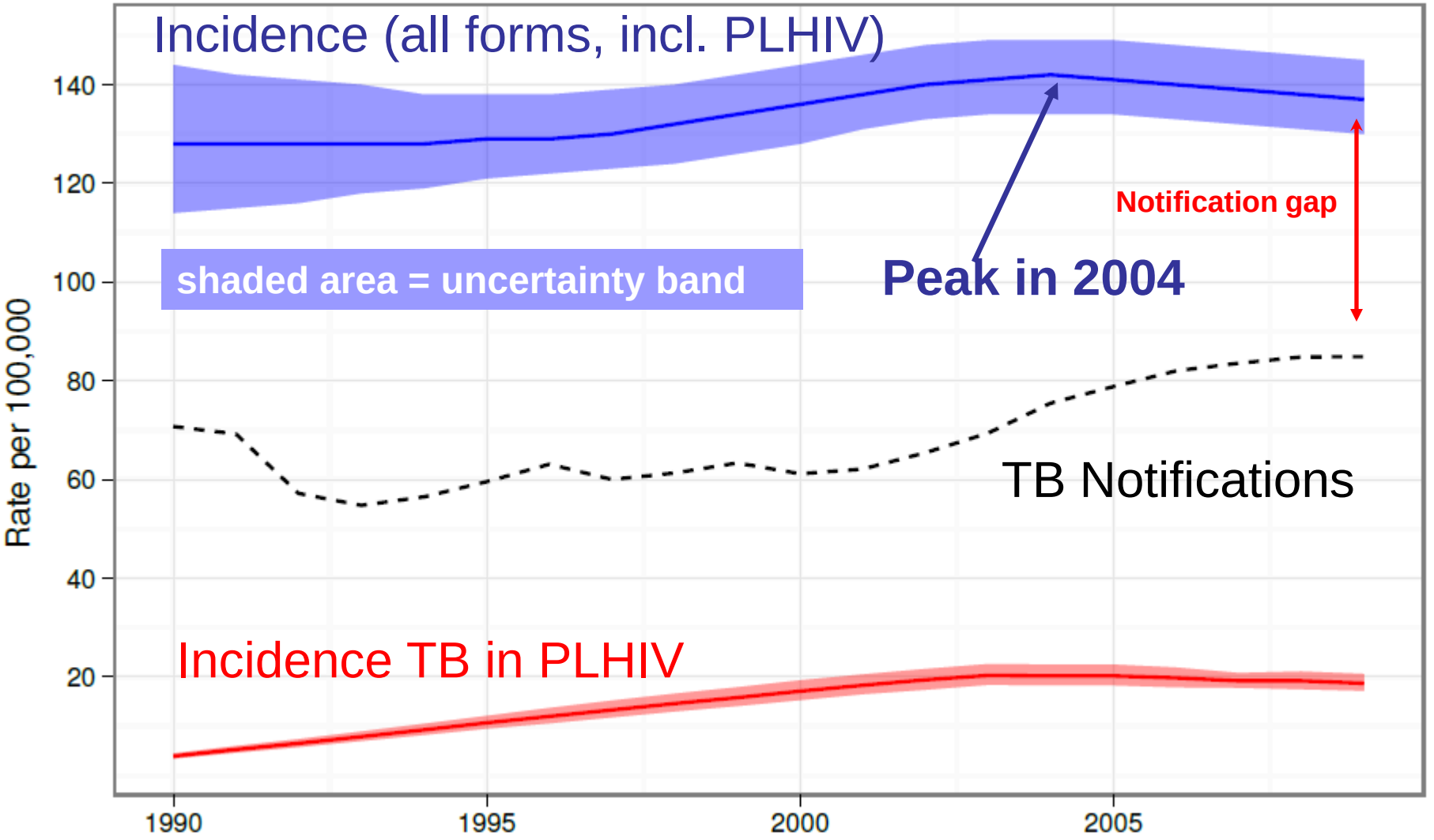
Pantoja A et al, IJTLD, 2009

Achievements thus far

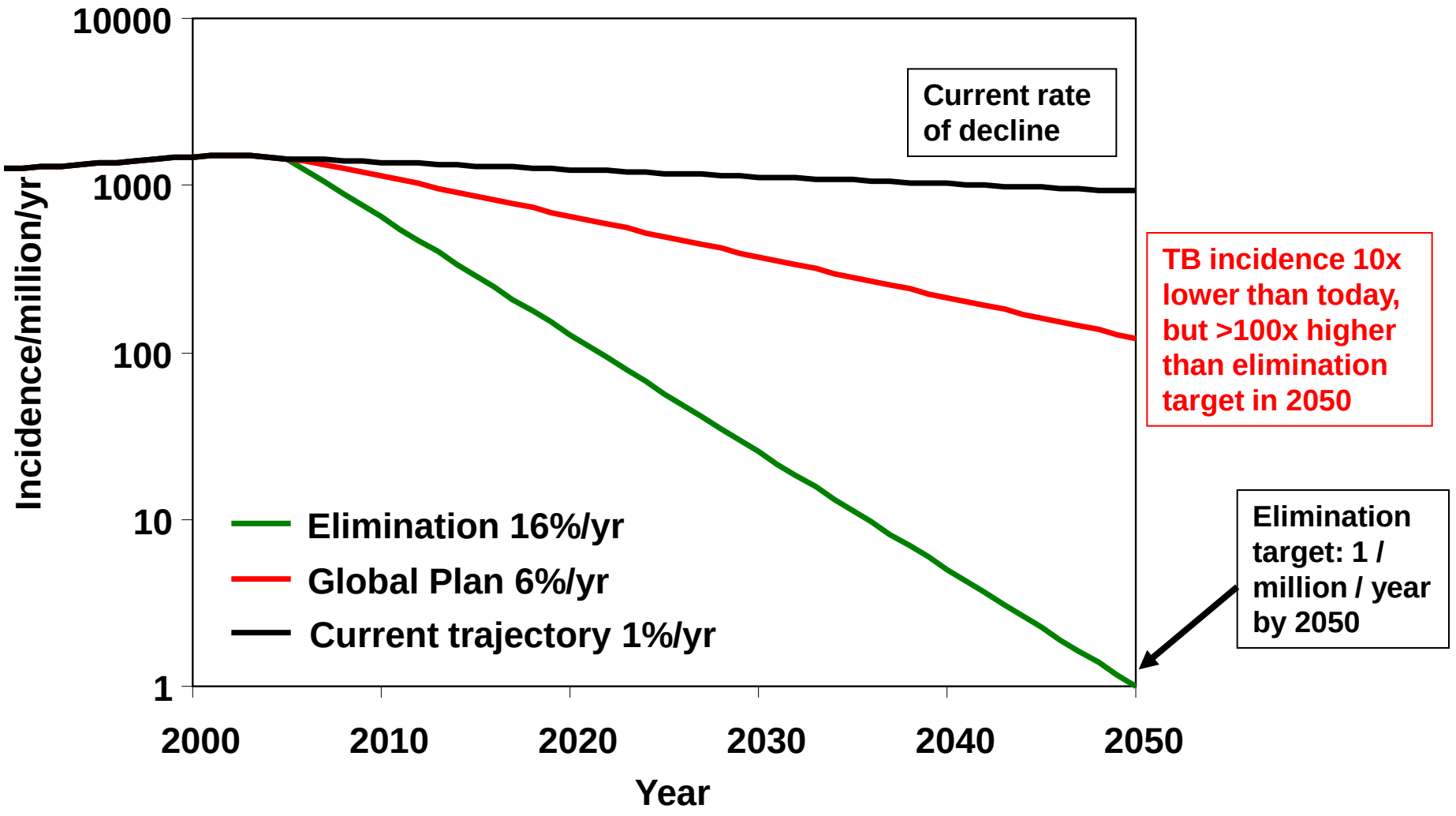
- 41 million patients cured, 1995-2009
- 6 million deaths averted compared to 1995 care standards
- Mortality reduced by 35% since 1990 and on track to achieve the 50% reduction target
- Cure rates >85%, care for TB/HIV improving
- (Non-ambitious) 2015 MDG target on track: global TB incidence peaked in 2004
- But…. TB incidence declining far too slowly and elimination impossible with current tools



Incidence rates falling globally after peak in 2004, but only at <1%/year



Full implementation of Global Plan: 2015 MDG target reached but TB not eliminated by 2050



THE LANCET

Tuberculosis 1

Tuberculosis control and elimination 2010–50: cure, care, and social development

Knut Lönnroth, Kenneth G Castro, Jeremiah Muhwa Chakaya, Lakhbir Singh Chauhan, Katherine Floyd, Philippe Glaziou, Mario C Raviglione

Rapid expansion of the standardised approach to tuberculosis diagnosis and treatment that is recommended by WHO allowed more than 36 million people to be cured between 1995 and 2008, averting up to 6 million deaths. Yet tuberculosis remains a severe global public health threat. There are more than 9 million new cases every year worldwide, and the incidence rate is falling at less than 1% per year. Although the overall target related to the Millennium Development Goals of halting and beginning to reverse the epidemic might have already been reached in 2004, the more important long-term elimination target set for 2050 will not be met with present strategies and instruments. Several key challenges persist. Many vulnerable people do not have access to affordable services of sufficient quality. Technologies for diagnosis, treatment, and prevention are old and inadequate. Multidrug-resistant tuberculosis is a serious threat in many settings. HIV/AIDS continues to fuel the tuberculosis epidemic, especially in Africa. Furthermore, other risk factors and underlying social determinants help to maintain tuberculosis in the community. Acceleration of the decline towards elimination of this disease will need invigorated actions in four broad areas: continued scale-up of early diagnosis and proper treatment for all forms of tuberculosis in line with the Stop TB Strategy; development and enforcement of bold health-system policies; establishment of links with the broader development agenda; and promotion and intensification of research towards innovations.

Published Online
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This is the first in a Series of eight papers about tuberculosis

Stop TB Department, WHO, Geneva, Switzerland (K Lönnroth PhD, K Floyd PhD, P Glaziou MD, M C Raviglione MD); **Division of TB Elimination National Center for HIV, Viral Hepatitis, STD and TB Prevention, Centers for Disease Control and Prevention, Atlanta, GA, USA** (K G Castro MD); **National**

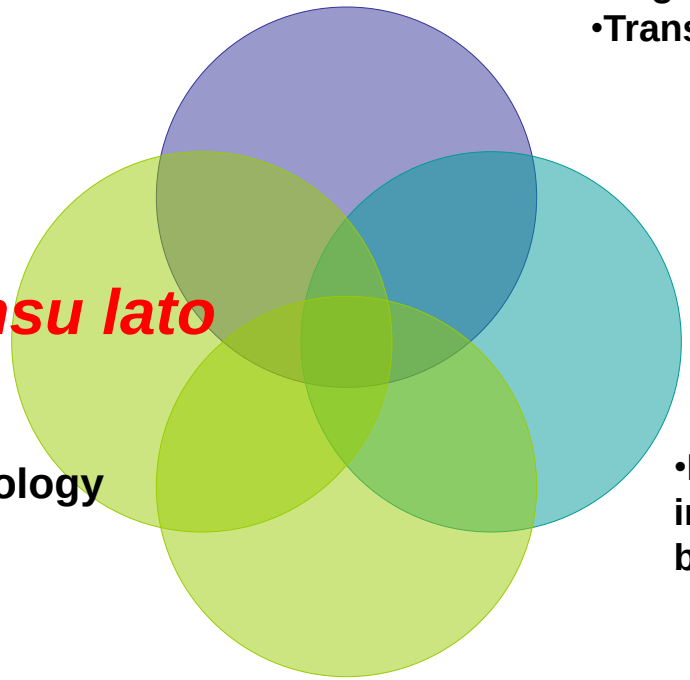
WHO THE STOP TB DEPARTMENT

Innovative action needed in 4 spheres

WHO THE STOP TB DEPARTMENT

TB care and control

- Early & increased case detection
- Scale-up TB/HIV and MDR-TB interventions
- M&E and impact measurement
- Engage all care providers
- Transfer of modern technology



Research *sensu lato*

- New tools
- Operational research
- Rapid transfer of technology

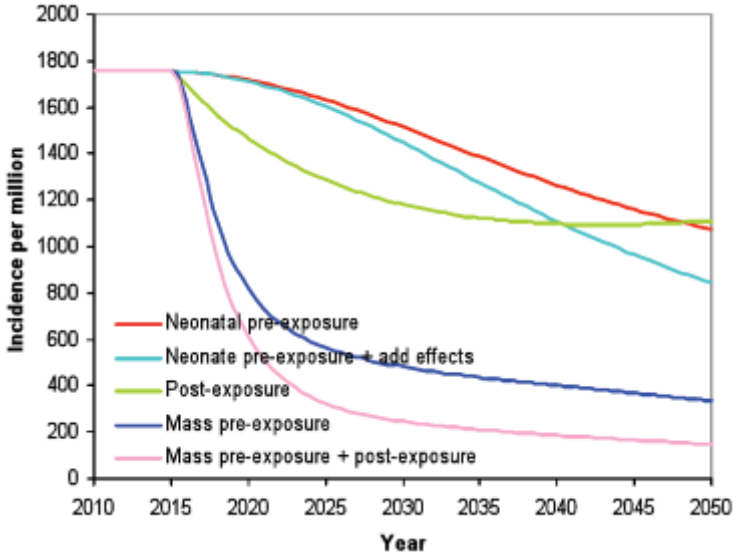
Development agenda

- Living conditions, food insecurity, awareness, risk behaviour, access to care

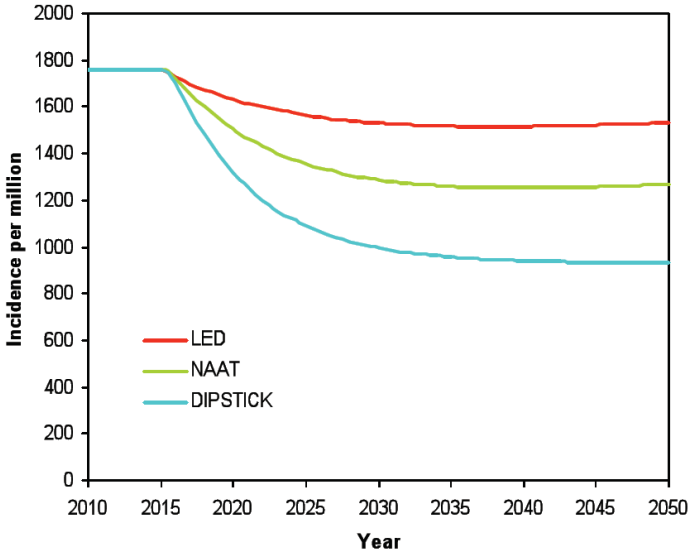
Health system policies

- Free services, quality drugs, regulated private care, M&E

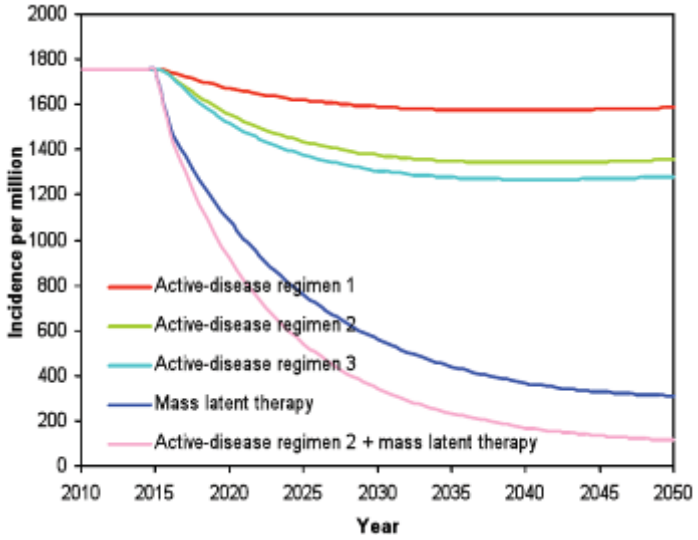
Potential impact of new TB vaccines, diagnostics and drugs in SE Asia



Add. Effects = effects also on latency and infectiousness of cases in vaccinated



- Led & NAAT at microscopy lab level
- Dipstick at point of care

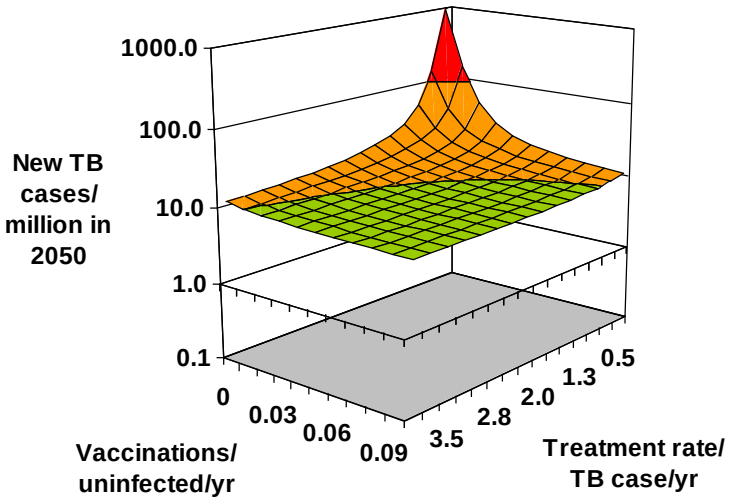


- Regimen 1 = 4-month, no effect on DR
- Regimen 2 = 2-month, 90% effective in M/XDR
- Regimen 3 = 10-day, 90% effective in M/XDR

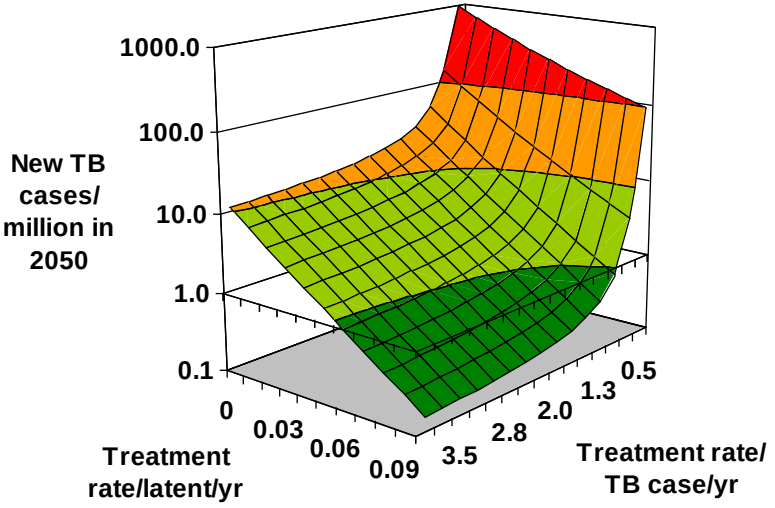
Source: L. Abu Raddad *et al*, PNAS 2009

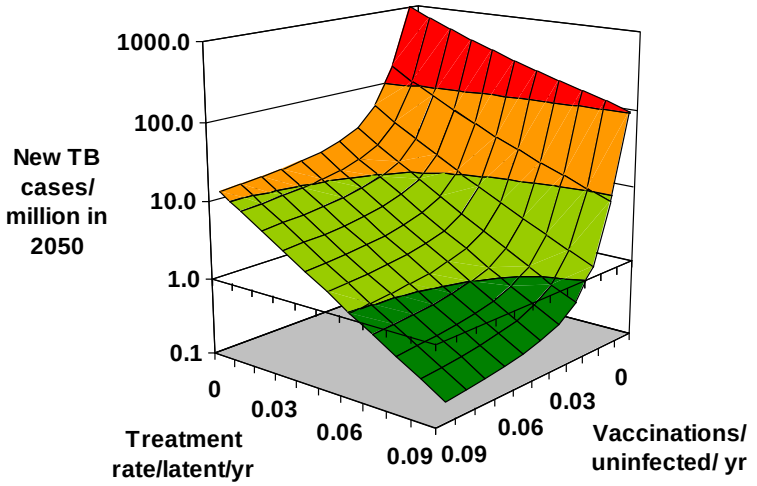
Elimination of TB will require synergistic interventions

NOT by preventing infection & treating active TB
(both act on cutting transmission)



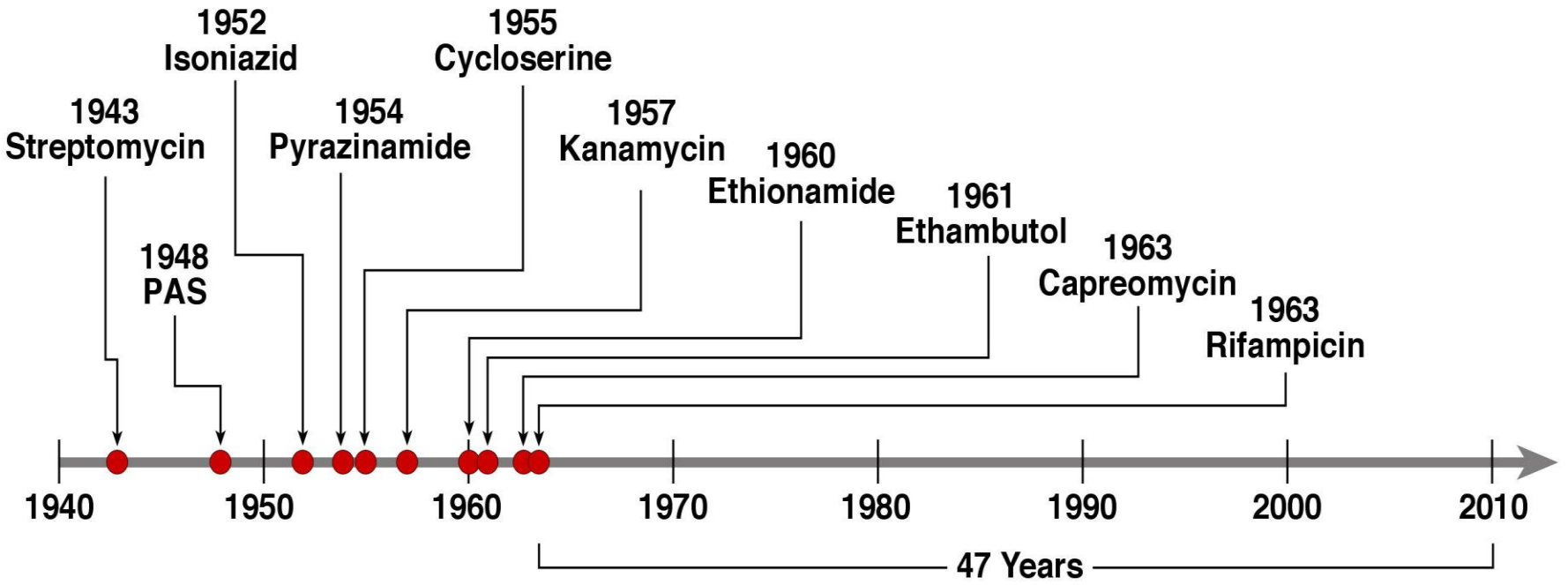
But by treating latent infection and active TB or by preventing and treating latent infection *(cutting transmission and reactivation)*





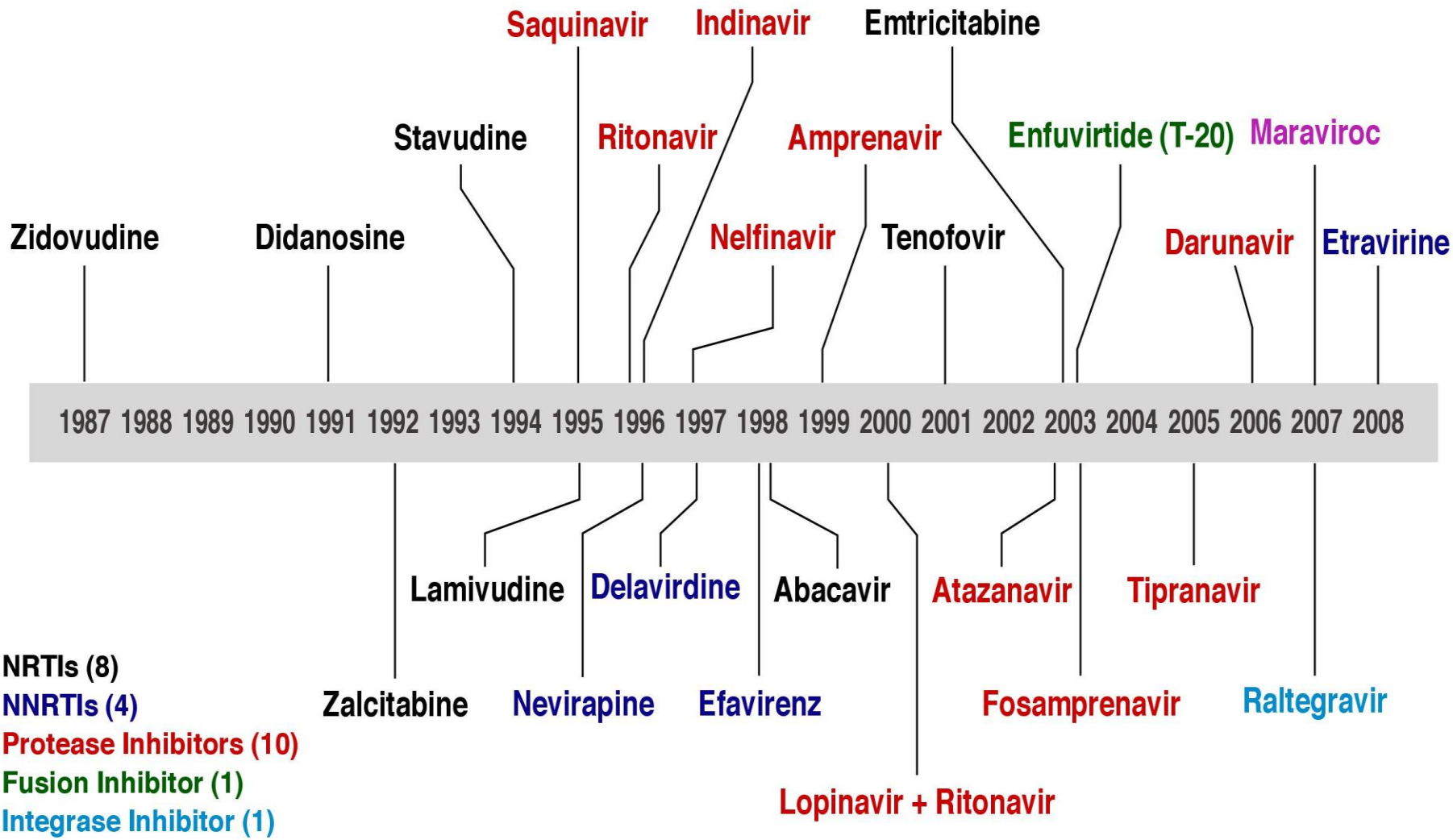
Dye C & Williams BG, J.R. Soc. Interface 2007

TB Drug Discovery



Source: Ma and Lienhardt, *Clin Chest Med*, 2009

30 FDA-Approved Antiretroviral Drugs



Conclusions

WHO THE STOP TB DEPARTMENT

1. The world is on track to achieve the 2015 targets for reductions in incidence (fairly un-ambitious target) and mortality (35% decline since 1990)

2. However, to seriously think of elimination in 2050 new discoveries, POC diagnostics, shorter therapeutic and preventive regimens, and potent vaccines are indispensable

3. Research efforts need to be harmonised as much as possible, so that we can build a "continuum" across fields and among all investigators maximising knowledge sharing and promoting consensus on strategic directions

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